ARDAROSTIG LRD

VOLUME II

Main Statement



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CHAPTER ONE

INTRODUCTION

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CHAPTER ONE

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CHAPTER 1 | Introduction

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) sets out the results of the environmental assessments which have been completed for the proposed development to inform the planning consent process.

The assessment has been completed as a statutory environment assessment. The environmental impact assessment process has been completed in line with Directive2014/52/EU, based on the guidance presented in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022).

EIA is a process for anticipating the effects on the environment caused by a development. The document produced as a result is termed the EIAR. Article 1(2)(g) of the 2014 Directive (2014/52/EU) states that:

> *"Environment impact assessment" means a process consisting of:*
>
> *(i) The preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2).*
>
> *(ii) The carrying out of consultations as referred to in Article 6 and, where relevant, Article 7.*
>
> *(iii) The examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7.*
>
> *(iv) The reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and*
>
> *(v) The integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a."*

The EIAR is a presentation of the potential environmental impacts of the proposed development with a focus on significant impacts.

Chapter 1 introduces the project and described the scope and methodology of the EIA process. The consultation process which was undertaken is outlined and the competencies of the environmental assessment team are provided.

1.1.1 Author Information and Competency

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR, the Applicant engaged McCutcheon Halley Chartered Planning Consultants to direct and coordinate the preparation of the EIAR and a team of qualified specialists were engaged to prepare individual chapters. The consultant firms and lead authors are listed in **Table 1**. Details of competency, qualifications, and experience of the lead author of each discipline is outlined in the individual chapters.

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master's in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 3 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a Corporate member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR's, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, single 'one – off' developments, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

Table 1 Chapters of EIAR & Contributors

Chapter	Aspect	Consultancy	Lead Consultant
1	Introduction	McCutcheon Halley Planning Consultants	Ciaran Dineen
2	Project Description	McCutcheon Halley Planning Consultants	Ciaran Dineen
3	Alternatives	McCutcheon Halley Planning Consultants	Ciaran Dineen
4	Population & Human Health	McCutcheon Halley Planning Consultants	Ciaran Dineen
5	Landscape & Visual	JBA Consulting Engineers	Maria Ines Timoteo
6	Material Assets: Traffic & Transport	MHL Consulting Engineers	Brian Murphy
7	Material Assets: Built Services	OSL Consulting Engineers	Ben Mong
8	Material Assets: Waste	AWN Consulting	Chonaill Bradley
9	Land & Soils	JBA Consulting Engineers	Conor O'Neill
10	Water & Hydrology	AWN Consulting	Luke Maguire
11	Biodiversity	Enviroguide	Tom Ryan
12	Noise & Vibration	AWN Consulting	Dominic Wright
13	Air Quality	AWN Consulting	Ciara Nolan
14	Climate	AWN Consulting	Ciara Nolan
15	Cultural Heritage – Archaeological & Built Heritage	Lane Purcell Archaeology	Musetta O'Leary
16	Risk Chapter	McCutcheon Halley Planning Consultants	Ciaran Dineen
17	Interactions of the Foregoing	McCutcheon Halley Planning Consultants	Ciaran Dineen
18	Summary of Mitigation Measures	McCutcheon Halley Planning Consultants	Ciaran Dineen

1.1.2 The Applicant

The applicant is Bridgewater Homes Ltd. Bridgewater Homes Ltd are an experienced housing and development firm who have contributed to the construction of new residential homes throughout the City and County of Cork, creating high-quality residential environments. They are seeking permission for this large scale residential development to add to the existing housing stock within the Bishopstown area, on lands that have been identified suitable for the provision of new residential development.

1.1.3 Reference to Guidelines Relevant to Discipline

This chapter has been prepared having regard to the following guidelines:

- Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA), May 2022).
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003).

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- EU Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017).
- EU Environmental Impact Assessment of Projects: Guidance on Scoping (EU, 2017).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (OPR,2018).

1.1.4 Brief Project Description

A detailed description of the project is provided in Chapter 2. To summarise, the proposed development consists of a Large-Scale Residential Development (LRD) which consists of the construction of 246 no. residential units, a creche and all associated site development works atArdarostig (Townland), Bishopstown, Cork.

The Site Layout is shown below in Figure 1.1.

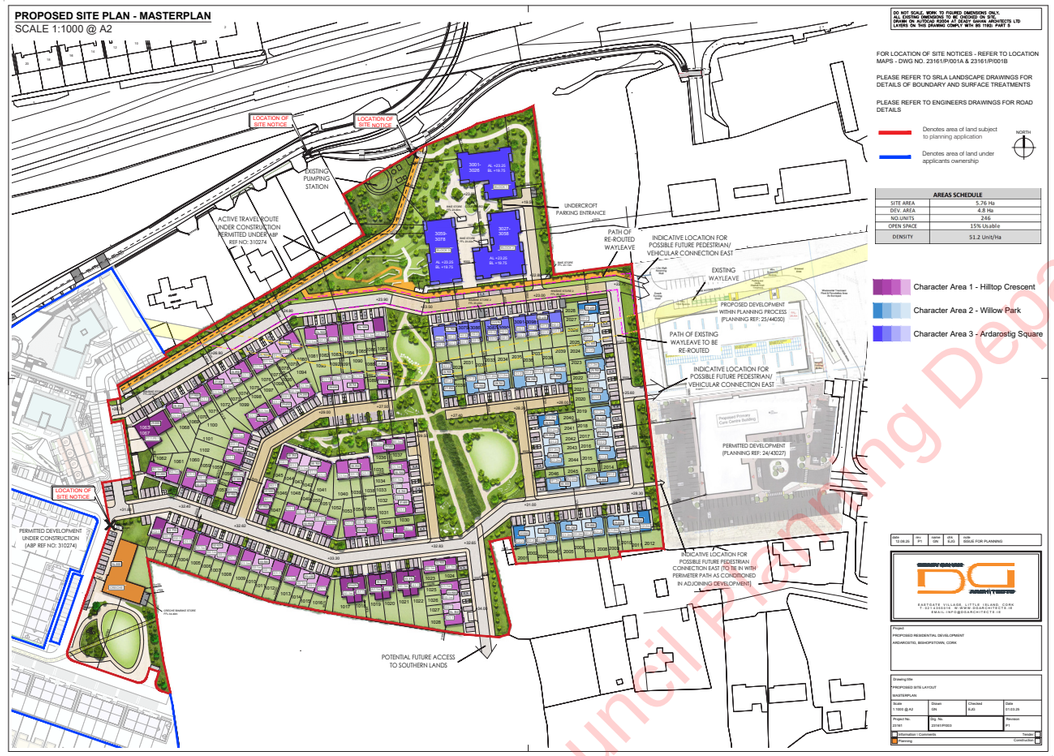


Figure 1.1 Site Layout

1.2 Site Location and Description

The site, which is 5.76 hectares in area and has a net developable area of 4.8 hectares, is located within the extended Cork City development boundary within the Southwestern Suburbs, to the south of the Bandon Road (N71) and N40 South Ring Road.

The subject site is situated approximately 6.1km southwest of Cork City Centre (15 minutes' drive), 2.5km southwest of Wilton Shopping Centre (8 minutes' drive) and 1.1km west of Bishopstown Court Neighbourhood Centre.

The site is bounded by the Waterfall Road/N40 and 4 no. dwellings to the north, light industrial uses to the east, agricultural land to the south and a residential development to the west, which is currently under construction. Access to the proposed development is to the west along Waterfall Road via the adjoining Waterfall Heights residential development.

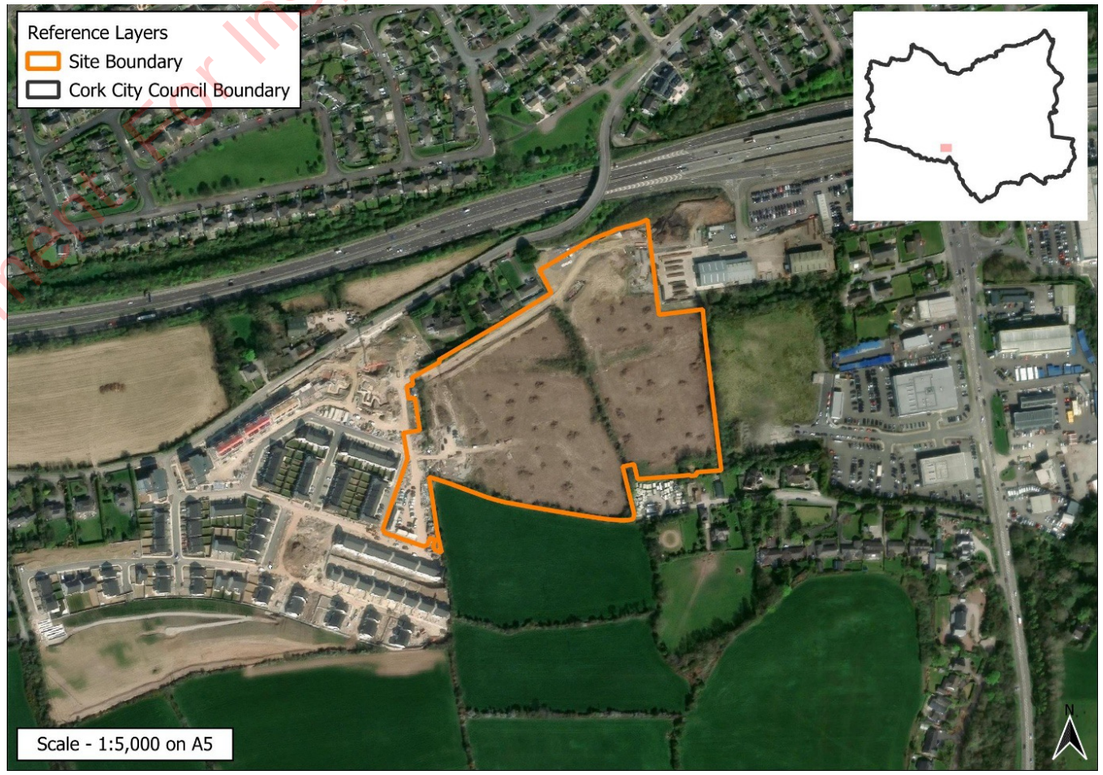


Figure 1.2 Site Location (Indicative site boundary only)

The site is also within a short walking distance of nearby bus stops, which is served by the 208-bus service along Curraheen Road (1.1km from the site), and the 236-bus service along Bishopstown Road (600 m from the site), both providing direct access to Cork City. Additional bus stops with more frequent public transport facilities are available along Curraheen Road.

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Munster Technological University (MTU) is located to 1.4km to the north of the site and Cork University Hospital is located 1.6km north-east. Other nearby notable locations include Bishopstown GAA and Pitch and Putt Club, primary and post-primary schools, Wilton Shopping Centre and Doughcloyne Industrial Estate.

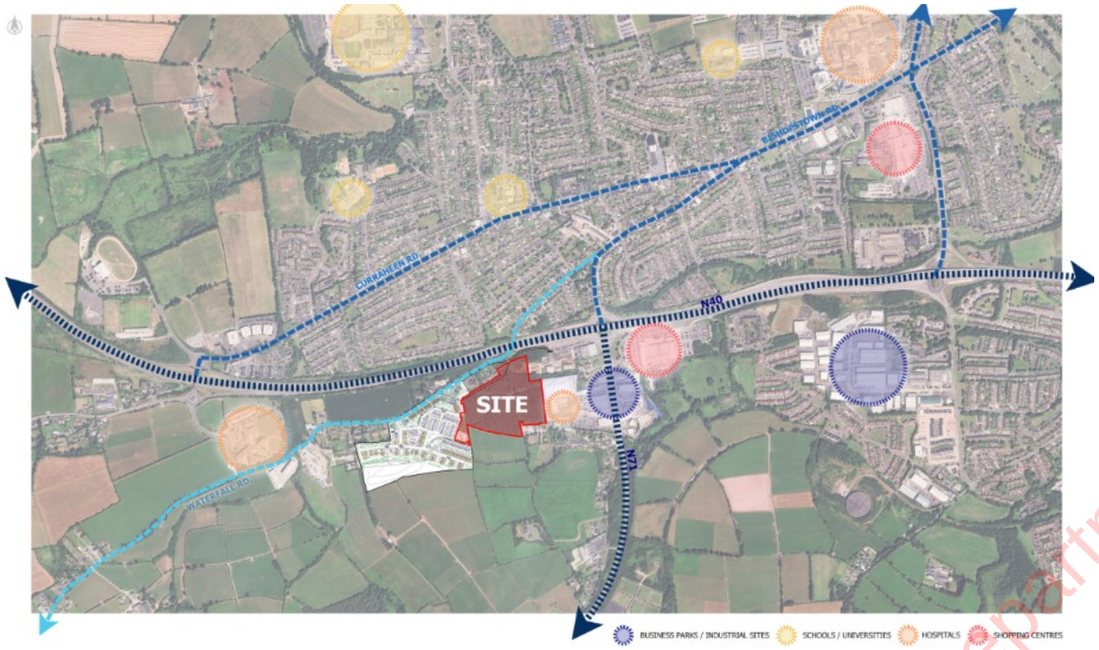


Figure 1.3 Indicative Site Location & Surrounding Context

1.2.1 Land Use Zoning Objective

In accordance with the Cork City Development Plan (CDP) 2022-2028 the subject site is primarily zoned ZO 01 'Sustainable Residential Neighbourhood' where the following objective applies:

> *"To protect and provide for residential uses and amenities, local services and community, institutional, educational and civic uses."*

Paragraph ZO 1.1 outlines that *"the provision and protection of residential uses and residential amenity is a central objective of this zoning."* With paragraph ZO 1.2 highlighting that development within this zone should generally respect the character and scale of the neighbourhood it is situated in.

A portion of the site to the southwest of the development 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."*

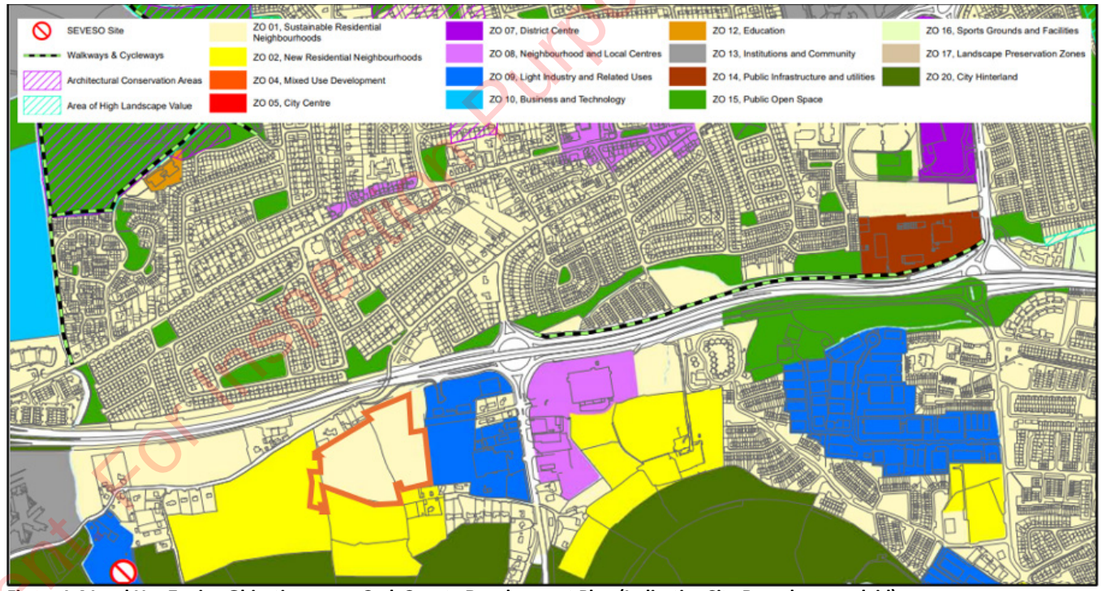


Figure 1.4 Land Use Zoning Objective as per Cork County Development Plan (Indicative Site Boundary overlaid)

This residential-led development is consistent with the zoning objective for the subject lands. The proposed uses comprising residential and childcare facility are all permissible uses under this zoning objective.

1.3 Requirement for EIAR

Environmental Impact Assessment (EIA) requirements derive from EU Directives. Council Directive 2014/52/EU amended Directive 2011/92/EU and is transposed into Irish Law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

Proposed developments which fall within one of the categories of development specified in Schedule 5 of the Planning and Development Regulations 2001, as amended, which equals or exceeds, a limit, quantity, or threshold prescribed for that class of development must be accompanied by an EIAR.

The proposed development falls within the class of development types requiring an EIA under Schedule 5 of the Planning and Development Regulations 2001 (as amended). The proposed development is subject to Part 2 of this Schedule which deals with infrastructure projects where EIA is required for:

> *10. b (1). Construction of more than 500 dwelling units.*
>
> *10. b (iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built up area and 20 hectares elsewhere*
>
> *(in this paragraph "business district" means a district within a city or town in which the predominant land use is retail or commercial).*

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The proposed Large-Scale Residential Development (LRD) comprises the construction of 246 no. residential units on a gross site area of 5.76ha. While this does not automatically trigger the need for mandatory EIAR as per Schedule 5 of the Planning and Development Regulations 2001, the proposed development is located adjacent to an adjoining residential development where 275 no. units were permitted on a site area of 7.13ha. Taking the permitted number of units into account along with the site area associated with this site and combining it with the development site and proposed development, the preparation of an EIAR as part of this application was considered appropriate. An EIAR is therefore required as the LRD comprises urban development on a site area that exceeds the 10ha threshold in a built-up area and comprises in excess of 500 no. residential units. These facts therefore trigger the need for a mandatory EIAR.

This EIAR has been prepared in accordance with the aforementioned legislative provisions and the following guidelines, among others, as specified in the various specialist EIAR chapters:

- Department of Housing, Planning and Local Government (DHPLG) (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- DHPLG (2017). Circular letter PL 1/2017 – Advice on Administrative Provisions in Advance of Transposition.
- European Commission (EC) (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.
- EC (2013). Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.
- EC (2017). Environmental Impact Assessment of Projects. Guidance on Scoping.
- EC (2017). Environmental Impact Assessment of Projects. Guidance on the preparation of Environmental Impact Assessment Report.
- EPA (2015). Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

1.4 Study Area

In general, the study areas are defined individually for each environmental topic, according to guidance and the geographic scope of the potential impacts or of the information required to assess those impacts. Details are provided by each discipline as part of the description of baseline conditions of the site.

1.5 Purpose of Environmental Impact Assessment

The objective of the Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA), before development consent being given, of public and private developments that are likely to have significant effects on the environment.

The 2014 Directive, for the first time, provides a definition of EIA and this is now defined by section 171A of the Planning and Development Act, 2000 (as inserted by Regulation 16 of the 2018 Regulations).

It is defined as a process consisting of:

a) the preparation of an EIAR by the developer;

b) the carrying out of consultations with the public, prescribed bodies (and, where relevant, any affected Member States);

c) the examination by the competent authority of the EIAR, any supplementary information provided, where necessary, by the developer and relevant information received through the consultation process;

d) the reasoned conclusion of the competent authority on the significant effects of the project on the environment; and

e) the integration of the competent authority's reasoned conclusion into any development consent decision.

The definition of EIA thus provides for a clear distinction between the process of environmental impact assessment to be carried out by the competent authority and the preparation by the developer of an EIAR.

Section 2 of the 2000 Act has been amended to define an EIAR as 'a report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive.

1.6 Content of Environmental Impact Assessment Report

The EIAR entails a systematic analysis and assessment of the potential environmental effects of a proposed development on its receiving environment. Article 3(1) of the amended Directive prescribes a range of environmental topics that must be addressed in the EIAR, as follows:

"The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

a) A description of the likely significant effects of the project on the environment;

b) A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

c) A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics and an indication of the main reasons for the options chosen, considering the effects of the project on the environment ; and

d) A non-technical summary; and,

e) Any additional information specified in Annex IV of the Directive/Schedule 6 to the 2001 Regulations, as amended, relevant to the specific characteristics of the project and to the environmental features likely to be affected."

As is required by Annex IV of the 2014 Directive, this EIAR addresses matters including proposed demolition works, risks to human health, major accidents/disasters, biodiversity, climate change and cumulative effects with other existing and/or approved projects.

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1.7 Competency

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR, the Applicant engaged McCutcheon Halley Chartered Planning Consultants to direct and coordinate the preparation of the EIAR and a team of qualified specialists were engaged to prepare individual chapters, the consultant firms and lead authors are listed in the **Table 1.1**. Details of competency, qualifications, and experience of the lead author of each discipline is outlined in the individual chapters.

Various environmental specialists were commissioned to complete the specialist chapters of the EIAR, as required by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment:

> *"Experts involved in the preparation of [EIARs] should be qualified and competent. Sufficient expertise, in the relevant field of the project concerned, is required for the purpose of its examination by the competent authorities in order to ensure that the information provided by the developer is complete and of a high level of quality".*

1.8 Format and Structure of the EIAR

This EIAR is prepared according to the 'Grouped Format Structure' as described in the Guidelines on information to be contained in Environmental Impact Statements (EPA, 2022). This means that each topic is considered as a separate section. The advantages of using this format are that it is easy to investigate a single topic and it facilitates easy cross-reference to specialist studies.

The EIAR is sub divided into 3 no. volumes as follows:

- **Volume I** Non-Technical Summary;
- **Volume II** Environmental Impact Assessment Report; and
- **Volume III** Appendices to Environmental Impact Assessment Report.

Volume II is presented as 18 chapters as outlined in Table 1-1.

Table 1.1 EIAR Chapters and Contributors

Chapter	Aspect	Consultancy	Lead Consultant
1	Introduction	McCutcheon Halley Planning Consultants	Ciaran Dineen
2	Project Description	McCutcheon Halley Planning Consultants	Ciaran Dineen
3	Alternatives	McCutcheon Halley Planning Consultants	Ciaran Dineen
4	Population & Human Health	McCutcheon Halley Planning Consultants	Ciaran Dineen
5	Landscape & Visual	JBA Consulting Engineers	Maria Ines Timoteo
6	Material Assets: Traffic & Transport	MHL Consulting Engineers	Brian Murphy
7	Material Assets: Built Services	OSL Consulting Engineers	Ed Kingston
8	Material Assets: Waste	AWN Consulting	Chonaill Bradley
9	Land & Soils	JBA Consulting Engineers	Conor O'Neill
10	Water & Hydrology	AWN Consulting	Luke Maguire
11	Biodiversity	Enviroguide	Tom Ryan
12	Noise & Vibration	AWN Consulting	Dominic Wright
13	Air Quality	AWN Consulting	Ciara Nolan
14	Climate	AWN Consulting	Ciara Nolan
15	Cultural Heritage – Archaeological & Built Heritage	Lane Purcell Archaeology	Musetta O'Leary
16	Risk Chapter	McCutcheon Halley Planning Consultants	Ciaran Dineen
17	Interactions of the Foregoing	McCutcheon Halley Planning Consultants	Ciaran Dineen
18	Summary of Mitigation Measures	McCutcheon Halley Planning Consultants	Ciaran Dineen

In addition, contributors have had regard to other relevant discipline-specific guidelines, these are noted in individual chapters of the EIAR.

1.9 Scoping

The purpose of scoping is to identify the information to be contained in an EIAR and the methodology to be used in gathering and assessing that information. The scope of this EIAR is informed by the requirements of the Directive 2014/52/EU and the transposing Regulations together with the Guidelines set out above. Applicants are not required to seek a formal scoping opinion.

The scope of individual assessments is informed by discipline specific guidelines and, where this is the case, they are referenced in each chapter.

Scoping requires the consideration of the nature and likely scale of the potential environmental impacts likely to arise from a proposed development or project. It is an iterative process that is ongoing throughout the development of the EIAR. The following topics, which include those stipulated in the amended Directive, have been scoped in for this assessment.

- Population and human health;
- Biodiversity (flora and fauna);
- Land and Soils
- Water and Hydrology;
- Air quality and climate;

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- Noise and vibration
- Landscape and visual amenity;
- Cultural heritage, archaeology and architectural heritage;
- Traffic and transportation;
- Waste;
- Services; and
- Interactions between the above-listed topics.

1.10 Scope of Cumulative Effects

Directive 2014/52/EU substituted a new Annex IV into Directive 2011/92/EU. Annex IV of the EIA Directive is to be read in conjunction with article 5(1) and sets out the information to be included in an EIAR. Annex IV was transposed into national law via article 97 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the "2018 Regulations") which substituted a new Schedule 6 into the Planning and Development Regulations 2000, as amended.

The Directive requires that the EIAR describes the cumulation of effects with other existing and/or approved projects.

Cumulative effects may arise from:

"- The interaction between the various impacts within a single project;

- The interaction between all the differing existing and / or approved projects in the same areas as the proposed project." [1]

In August 2018, the Department of Housing, Planning and Local Government issued Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. The Guidelines summarise "cumulative effects" in the following way at page 40;

> *"Effects are not to be considered in isolation but cumulatively i.e., when they are added to other effects. A single effect on its own may not be significant in terms of impact on the environment but, when considered together with other effects, may have a significant impact on the environment. Also, a single effect which may, on its own, have a significant effect, may have a reduced and insignificant impact when combined with other effects.*

Paragraph 2(e)(i)(V) of Schedule 6 (paragraph 5(e) of Annex IV) provides as follows;

> *"the cumulation of effects with other **existing or approved developments, or both**, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources." (emphasis added).*

Accordingly, each chapter of this EIAR assesses the cumulative effect of this permitted development in combination with the proposed development.

Individually, each specialist consultant has reviewed under construction, permitted, and or under consideration development in the local area, and using their expertise they have identified projects relevant to their discipline that may interact to produce a cumulative effect. The detail of the identified projects and plans is set out within each specialist chapter of this EIAR.

1 Department of Housing, Planning and Local Government, "Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment" (August 2018), page 40.

While the Directive does not require a cumulative assessment of future proposals where a planning application has not been lodged, recognising the broad scope and purpose of the EIA Directive, regard is had to the judgement of *Fitzpatrick v An Bord Pleanála* [2019] IESC 23, henceforth referred to as the 'Apple Case'.

The Supreme Court in the Apple Case held that:

> 1) An EIA must contain an assessment of the cumulative effects of future developments that form an "integral part" of the development applied for (i.e., where there is a "functional or legal interdependence" between the development applied for and the envisaged future development).

The development site is located in the townland of Ardarostig, Bishopstown, Cork. The site is located in proximity to a Strategic Housing Development, where 275 no. residential units were permitted in September 2021. A total of 196 units has been constructed and occupied to date, with the remaining balance to be fully constructed and occupied by the summer of 2026. This development adjoins the proposed development to the west.

To the north-west of the site, a residential development consisting of 164 no. residential units and a childcare facility has recently been permitted by An Comisiún Pleanála, while a proposal for a Primary Care Centre located to the east of the site was permitted by Cork City Council in February 2025. The Cork City to Kinsale Greenway proposal, located to the south-east of the site is currently at Preferred Route stage with public consultation ongoing at time of writing.

Table 1.2 Projects Considered for Cumulative Impact

	Reference	Development	Decision Details
1.	Cork City Council Ref No. 2443209 and ACP Ref:-321949-25	The construction of 164 residential units, a childcare facility, vehicular and pedestrian/ cycle entrances onto Waterfall Road, improvement works on Waterfall Road and all associated site works.	Decision granted by An Comisiún Pleanála on 05/06/2025
2.	ACP Ref No. 310274	Strategic Housing Development comprising 275 no. units and a creche at Ardrostig and Waterfall Road opposite the Rise/Halldene Villas junction, Bishopstown, Co. Cork	Decision granted by An Bord Pleanála (Now An Comisiún Pleanála) on 06/09/2021
3.	Cork City Council Ref. No. 2443027	Proposed development comprises the construction of Three-Storey Primary care centre to include 1 no. retail unit and 2 no. GP practices at ground floor at Ardrostig, Bishopstown, Cork.	Decision granted by Cork City Council on 04/02/2025
4.	Cork City Council/Cork County Council	Cork City to Kinsale Greenway	Currently at Preferred Route Stage https://corkkinsalegreenway.ie/
5.	Cork City Council Ref. No. 2544065	Proposed development comprises the construction of an Indoor Recreation Facility/Commercial Leisure Use building at Bandon Road (N71), in the townland of, Ardrostig, Bishopstown Cork.	Application was lodged on 31/07/2025 and is awaiting Council decision due on 24/09/2025

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Cumulative effects are not limited to projects, and it is necessary to also consider relevant Plans. According to the Environment Protection Agency (2020), in Ireland, key cumulative effects – where environmental receptors are at, or near, their thresholds or their capacity to assimilate more change – include climate change; water quality, flood risk, air quality, biodiversity and landscape. For the purpose of this EIAR, the following have been considered in relation to culminative impacts:

- **Cork City Development Plan 2022-2028** - gives spatial expression to the city's economic, social, housing, and cultural development. The Plan has a key role in protecting the environment, heritage, and amenities of the city and in mitigating against the impacts of climate change. It includes policies and objectives for all of the aspects included in this EIAR.
- **The Climate Action Plan, 2025** - climate change is the ultimate cumulative effect, nationally and internationally. Thresholds for greenhouse gas emissions are being exceeded. Under the Paris Agreement, Ireland pledged to reduce greenhouse gas emissions to 20% below 2005 levels by 2020, but it is set to exceed this target by 5–6%, and to exceed the 2021–2030 target by 25%. The Climate Action Plan 2025 puts forward measures for improving these trends, including increased use of renewable energy, and improved building energy efficiency, empowering a modal shift, and expanding the EV charging network.
- **National Biodiversity Plan 2023-2030** - The Plan sets out actions through which a range of government, civil and private sectors will undertake to protect and conserve biodiversity. It has been developed in line with the EU and International Biodiversity strategies and policies.
- **Standards in the EU Air Quality Directive and 'daughter' directives** - establish the levels of air pollutants that have no significant impacts on human health or the environment.

In addition, each of the specialist chapters (4 - 17) considers the cumulative effects of projects and plans relevant to the zone of influence and discipline specific factors.

1.11 Impact Assessment Methodology

Each chapter of this EIAR assesses the direct, indirect, cumulative, and residual impact of the proposed development for both the construction and operational stage of the proposed development.

The impact assessment methodology is detailed in relation to the various environmental topics in the respective chapters herein. The assessment of impacts is based on the source-pathway-receptor model, which dictates that, for an environmental impact to occur, there must be a source, a receptor which is sensitive to the effect in question, and a pathway by which the effect can reach the receptor. Unless otherwise stated, the criteria for effect / impact characterisation are as per the EPA guidelines (as set out in Table 1.2). The significance of an impact is determined through comparison of the character of the predicted effect to the sensitivity of the environment / receptor in question.

Table 1.2 Impact Rating Terminology

Quality of Effect	
Positive	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of and ecosystem, or by removing nuisances or improving amenities.
Neutral	No effects of effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Significance of Effect	
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight Effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effect	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effect	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.
Very Significant Effect	An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effect	An effect which obliterates sensitive characteristics.
Duration of Effects	
Momentary	Seconds to minutes
Brief	Less than 1 day
Temporary	Less than 1 year
Short-term	1-7 years
Medium-term	7-15 years
Long-term	15-60 years
Permanent	Over 60 years
Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).

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Probability of Effects	
Likely	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Type of Effects	
Indirect	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
Do Nothing	The environment as it would be in the future should the subject project not be carried out.
Worst Case	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable	When the full consequences of a change in the environment cannot be described.
Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic	Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

1.12 Consultation

A dedicated website for this proposed development is established and the EIAR is available at **website if applicable.**

The EIAR was scoped following an appraisal of the 2022 EPA Guidelines on Information to be contained within the EIAR, through design team meetings with the specialist consultants and the pre-planning meetings held with Cork City Council.

Prior to lodging this application, the required information has been issued to the Department of Housing, Planning and Local Government's EIA Portal. The purpose of this tool is to inform the public in a timely manner, of applications that are accompanied by an EIAR.

An Opinion was received from Cork City Council following the S247 pre-application consultation and S32B LRD Meeting and it contained details of this consultation. The project team's response to the Opinion is provided under separate document with the planning application.

The following prescribed bodies have been consulted in relation to the general scope of the EIAR.

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

Responses received along with a copy of the consultation information letter issued to each of the above prescribed bodies are presented in Appendix 1.1.

1.13 References and Sources

Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA), May 2022); https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003). https://www.epa.ie/publications/monitoring--assessment/assessment/advice-notes-on-current-practice-in-the-preparation-of-environmental-impact-stat.php

EU Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017). https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf

EU Environmental Impact Assessment of Projects: guidance on Scoping (EU, 2017). https://ec.europa.eu/environment/eia/pdf/EIA_guidance_Scoping_final.pdf

Guidelines for Planning Authorities and An Bord Pleanála on carrying our Environmental Impact Assessment (OPR, 2018). https://www.opr.ie/wp-content/uploads/2019/08/2018-Environmental-Impact-Assessment-1.pdf.

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CHAPTER TWO

PROJECT DESCRIPTION

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CHAPTER TWO

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CHAPTER 2 | Project Description

2.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) sets out the proposed development and provides details in relation to the demolition, construction and operational phases of the scheme. The chapter was prepared in conjunction with the relevant member of the Design Team, and it should be read in conjunction with the submitted drawings together with supporting reports.

2.2 Expertise and Qualifications

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master's in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 3 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR's, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, single 'one – off' developments, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

2.3 Proposed Development Site

The site which is 5.76 hectares in area with a net developable area of 4.8 hectares, is located in Ardarostig (townland), Bishopstown, Cork. The site is located within the extended Cork City development boundary within the Southwestern Suburbs. The subject site is situated approximately 6.1km southwest of Cork City Centre (15 minutes' drive), 2.5km southwest of Wilton Shopping Centre (8 minutes' drive) and 1.1km west of Bishopstown Court Neighbourhood Centre. The site lies to the southwest of the Bandon Road roundabout and south of the South Ring Road N40. The Bandon Road (N71) and N40 South Ring Road are important routes providing direct access to the N22 (Killarney and Tralee Road).

The site is bounded by the Waterfrall Road/N40 and 4 no. dwellings to the north, light industrial uses to the east, agricultural land to the south and a residential development to the west (Waterfall Heights), which is currently under construction. Access to the proposed development is to the west along Waterfall Road via Waterfall Heights.

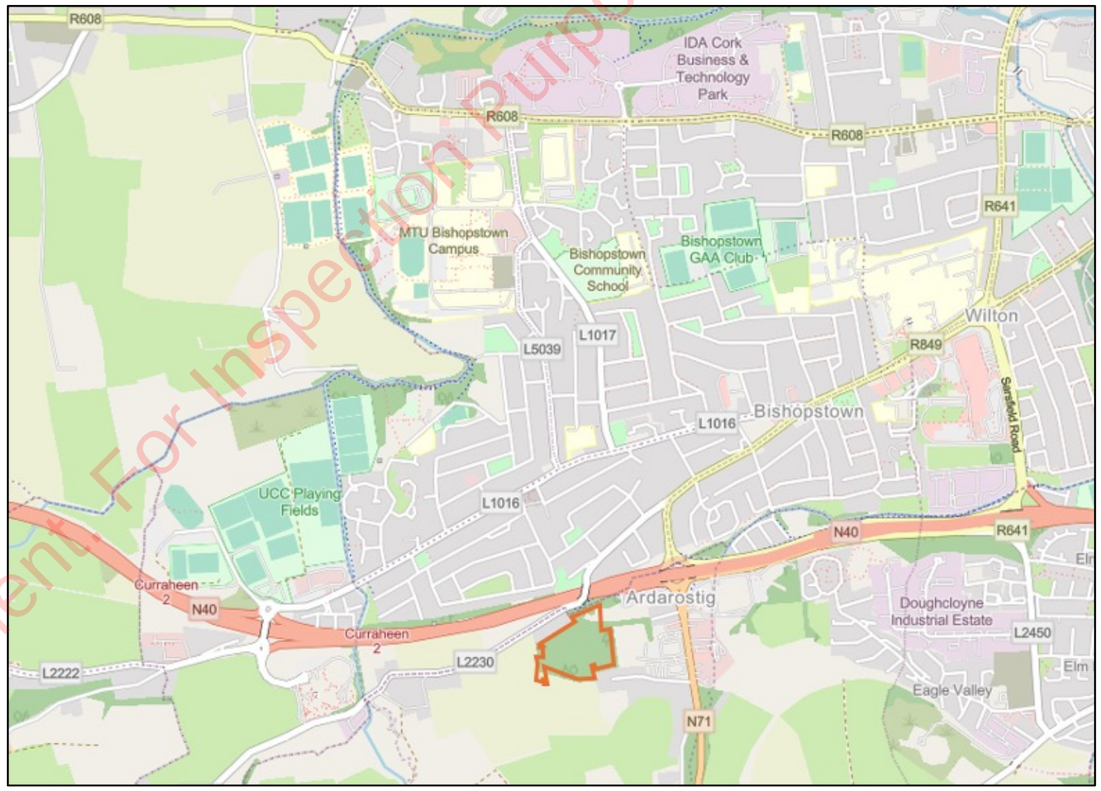


Figure 2.1 Indicative Site Location and Surrounding Context

The subject land is predominantly a greenfield site which has features and characteristics which will help create a positive living environment by retaining the natural assets and ecological features contained within its existing setting.

The subject site is primarily zoned ZO 01 'Sustainable Residential Neighbourhood' where the following objective applies:

> *"To protect and provide for residential uses and amenities, local services and community, institutional, educational and civic uses."*

Paragraph ZO 1.1 outlines that "the provision and protection of residential uses and residential amenity is a central objective of this zoning." With paragraph ZO 1.2 highlighting that development within this zone should generally respect the character and scale of the neighbourhood it is situated in.

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A portion of the site to the southwest of the development 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."*

An overview of the key development statistics is set out in the following Table:

Table 2.1 Development Overview

Development Statistics	
Gross Site Area	5.76 ha
Net Site Area	4.8 ha
No. Units	246
Tenant Amenities & Facilities	Creche – 747sqm with 140 childcare spaces
Non-Residential Uses	Creche – 747sqm with 140 childcare spaces
Density	51.2 dwellings per hectare (net)
Building Height	2-5 storeys
Unit Mix Summary	52 no. 1 bed unis (21%) 91 no. 2 bed units (37%) 90 no. 3 bed units (36.5%) 13 no. 4 bed units (5.5%)
Car Parking	299
Bicycle Parking	228
Dual Aspect Units	226
Public Open Space	15% Usable
Communal Amenity Space	1228sqm
Plot Ratio (Net)	0.46
Site Coverage (Net)	26.2%

2.3.1 Proposed Development

The proposed development consists of the following;

A Large-Scale Residential Development (LRD) located at Waterfall Road, Ardarostig (townland), Bishopstown, Cork comprising the construction of 246 no. residential units and a creche located to the east of and connected to the Waterfall Heights residential development which was permitted by An Coimisiún Pleanála under Ref. No. 310274 and is currently under construction. The proposed LRD comprises 143 no. dwelling houses (comprising a mix of 2, 3, and 4 bed semi-detached and townhouse/ terraced units) and 103 no. duplex/apartment units (comprising 25 no. 1, 2 and 3 bed duplex/apartment units and 78 no. 1 and 2 bed apartments in 3 no. Blocks ranging in height from 4 to 5 storeys with basement/undercroft parking), a 747 sqm creche and all associated ancillary development works including vehicular, cycle and pedestrian access, drainage (including the re-routing of an existing wayleave), landscaping, amenity and open space/play areas, footpaths and cycle lanes, boundary treatments, bicycle and car parking, bin and bike storage, public lighting and all other ancillary development. There are vehicular, cycle and pedestrian connections to the Waterfall Heights residential development (including two vehicular connection points connecting on to the Waterfall Road via the Waterfall Heights development); a pedestrian/cycle connection to the north (onto an existing footpath/cycle way); and provision for future vehicular, cycle and pedestrian access points to the adjoining lands to the south and east of the proposed development.

2.3.2 Non-Residential Uses

As part of the proposed development, it is proposed that some on-site residential uses will be provided. As per the proposed development description, the proposal includes the provision of 1 no. childcare facility. The creche is designed to provide 140 childcare places and amounts to 747sqm.



Figure 2.2 CGI Render of Proposed Creche (Deady Gahan Architects)

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2.3.3 Housing Mix and Type

The proposed development includes the construction of 246 no. residential units which comprise a mix of the following unit sizes:

- 52 no. 1 bed units
- 91 no. 2 bed units
- 90 no. 3 bed units
- 13 no. 4 bed units

The proposed mix of house types consists of semi-detached, townhouses, duplexes, and apartments which we consider will add to the existing and permitted housing types in the area. The proposed mix incorporates an appropriate range of housing types that reflect the current demand for housing and is consistent with the dwelling mix as outlined by the CDP.

Of the 246 no. units to be provided;

- 143 no. houses
- 103 no. apartments

2.3.4 Height

The proposed development consists of the construction of 246 no. residential units to include 143 no. dwelling houses (comprising a mix of 2,3, and 4 bed semi-detached, and townhouse/terraced units) and 103 no. duplex/apartment units (comprising 25 no. 1, 2 and 3 bed duplex/apartment units and 78 no. 1 and 2 bed apartments in 3 no apartment blocks). The apartment blocks range in height from 4 to 5 storeys with basement/undercroft parking. The height across the site therefore ranges from 2-5 storeys.

2.3.5 Materiality

The building materials will help establish a clear identity, contributing to a unique character in each area of the new neighbourhood. The placement of materials on individual units is guided by their durability and visual appeal. The development is designed to foster neighbourhoods with distinct architectural identities, each centred around a shared open space. These character areas create a strong sense of place through a combination of landmark housing typologies and a curated mix of materials unique to their setting.

Character Area 1 includes finishes such as beige brick and off-white render finish, Character Area 2 incorporates grey brick as the primary material, while Character Area 3 are defined by the apartment blocks, which are characterised by large windows, pressed metal and private balconies.

Character area 1 has a distinctive elevational treatment that features narrow windows, light green window frames, door bay frame, flushed eaves, bay/pop-out windows, and dormer windows. Beige brick and off-white render finish are the predominant materials proposed for this character area.



Figure 2.3 CGI Render of Character Area 1 Typologies and Materials (Deady Gahan Architects)

Character area 2 includes a grey brick finish as the primary material as well as feature elevational treatment, accompanied by off-white smooth plaster finish, spandrel panel, grey window frames, and dormer windows. The contrasting materials and unique elevational treatment in this area creates a distinct community within the overall scheme.



Figure 2.4 CGI Render of Character Area 2 Typologies and Materials (Deady Gahan Architects)

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Character area 3 is made up of the apartment blocks which feature characteristics such as large windows, pressed metal with feature lines and private walkout balconies. Red brick and off-white render finish are the predominant materials proposed for this character area. This provides a subtle link to the materials used on the existing apartment blocks on the adjacent site, while being unique enough to give future residents a distinct sense of community in the development.



Figure 2.5 CGI Render of Character Area 3 Typologies and Materials (Deady Gahan Architects)

2.3.6 Access, Parking & Connections

2.3.6.1 Access and Connections

It is proposed that the site will be accessed from the west off Waterfall Road via Waterfall Heights with 2 no. site entrances with potential future connections located along the eastern and southern boundaries.

Connectivity, legibility and permeability are some of the key themes of the scheme and develops from the wider surrounding area to the local environment. Permeability and connections between the variety of public spaces will be incorporated throughout the site. The existing north-south historic hedgerow is a unique existing feature and will be retained and integrated into the landscaping concept.

In the local context, the provision for connections to the east, north and west via proposed footpaths and utilising the permitted active travel route along the north boundary, will foster a sense of identity and community for the area. A proposed active travel path will run parallel to the historic north-south hedgerow, connecting to the permitted path to provide essential connectivity to Bandon Road and form there, eastward to Cork City. The internal connections within the site will provide easy access from the dwellings to these active travel routes and site amenities and are a crucial element in providing passive surveillance and promoting active neighbourhoods.

To ensure the visual integration of the site, the proposed development will promote the protection and enhancement of natural features on site, including hedgerows/vegetation. These features are integrated within the proposed development to emboss the identity of the proposed character areas.

Particular attention was placed in the design of the public open spaces to create a strong and well-connected network of usable and enjoyable green areas, pedestrian paths, plazas and shared surfaces. These features will enhance/contribute to creating a sense of place.

The hedgerows/vegetation within the site have been incorporated into the open space design to create visual and physical connections between the dwellings and open spaces on site. These connections also create breaks in the built environment.

A large open space is located to the centre of the site and acts as a node point in the development. This open space is strategically located to protect the historic hedgerow which runs through it, giving it adequate space to ensure its protection.

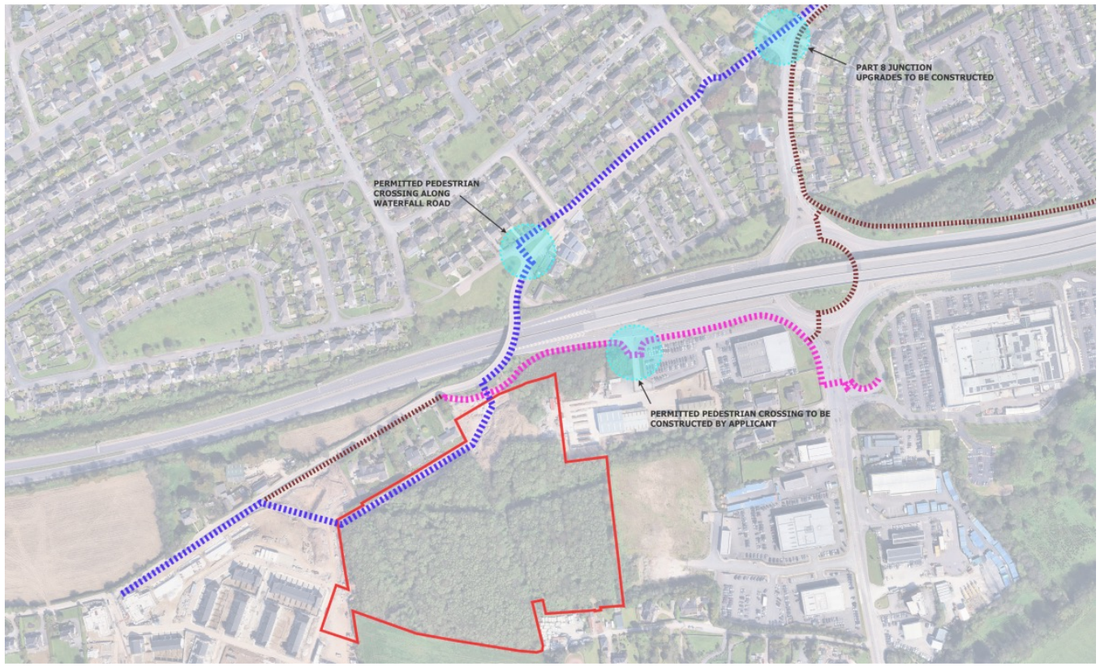


Figure 2.6 Primary Pedestrian/ Cycle Routes Proposed with potential connections (Deady Gahan Architects)

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2.3.6.2 Car Parking

Parking spaces are to be provided and are compliant with the 'Cork City Development Plan 2022-2028'. A total of 299 no. parking spaces is to be provided: 242 no. allocated parking spaces, 39 no. communal spaces, 9 no. visitor spaces and 9 no. creche spaces.

The car parking provision is broken down in further detail under Dwg. No. 23161/P/007 – 'Proposed Parking Allocation' by Deady Gahan Architects, provided under separate cover with the application material submitted.

All allocated spaces will be equipped with necessary infrastructure and ducting for charging points.

2.3.6.3 Cycle Parking

All houses and ground floor apartments that have direct access to rear gardens or private amenity to the front of units can utilise these areas for bicycle storage. Allocated bicycle spaces are assigned to a number of unit types, while communal spaces are also available for the apartment blocks. Details of bicycle parking spaces are provided under Dwg. No. 23161/P/007 – 'Proposed Parking Allocation' by Deady Gahan Architects, provided under separate cover with the application material submitted.

In total 228 no. bike storage spaces are to be provided throughout the site. This includes 60 no. visitor spaces and 22 no. spaces for the creche – equating to 228 no. spaces total are to be provided.

Table 2.2 Car and Cycle Parking Spaces

	Car Parking Spaces	Cycle Parking Spaces
Total Parking Spaces	299	228
Communal Parking Spaces	39	N/A
Visitor Parking Spaces	9	60
Childcare Facility	9	22

2.3.7 Landscape

2.3.7.1 Public Open Space

The protection and enhancement of the sites existing natural features will inform the character of planting and sense of place it derives from. In turn, there will be a net gain for biodiversity by planting native tree species coupled with plants selected form a list of pollinator friendly species and maintained to increase the availability of flowering plants in the summer months.

Public open space reflects 15% of the overall site area, with active spaces provided throughout the site. The landscape design for this site will prioritise pedestrians, ensuring a comfortable and acceptable movement between the residential developments, commerical spaces, green spaces and the central woodland linear park. A network of well-designed pathways creates safe, inviting routes that enhance connectivity and encourage active travel.



Figure 2.7 General Landscape Plan (Simon Ronan Landscape Architect)

2.3.7.2 Communal Amenity Space

Communal open space will be provided throughout the site but is mostly concentrated within the open space allocated to the 3 no. apartment blocks, where 928sqm of communal open space is provided. A total of 1228sqm of open space is provided throughout the site.

2.3.7.3 Private Amenity Space

Each unit has access to private amenity spaces such as a garden for the houses and a balcony or a small garden for the apartments. All homes will be constructed to prevent acoustic transfer and have been sited to prevent overlooking into adjacent private gardens. Houses have a private back garden and are placed back-to-back with a distance greater than 16m to guarantee privacy.

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Figure 2.8 Private and Public amenity spaces (Deady Gahan Architects)

2.3.7.4 Boundary Treatments

Details of proposed internal boundary treatments are provided under Dwg. No. 23161/P/007 – Proposed Internal Boundary Treatments, by Deady Gahan Architects. Such treatment types proposed include post and timber fencing, rendered and capped block walls and concrete and panel fencing.

2.3.8 Drainage

A full description is contained in the **Engineering Services Report** that accompanies this application under separate cover and it should be read in conjunction with this section.

2.3.8.1 Wastewater

The wastewater from the proposed units is a gravity flow system connecting into the existing foul pipes, to the north of the subject site, which discharge to the new wastewater pumping station, installed under CDS2100847802 as part of the Waterfall Heights development works.

The proposed new foul sewer network will be located within the public road and green area and will be combination of 150mm & 225mm diameter sewer.

The pre-connection enquiry CDS24008665 has been submitted to Uisce Eireann outlining how a connection the Irish Water Network can be facilitated foul sewerage infrastructure network developed under CDS2100847802**.**

A 'blind' manhole (F102) is already installed to the North of the site and is already connected, by gravity, to the network discharging to an existing wastewater pumping station (WWPS).

This serves a 225mm pipe which has been installed to cater for additional development lands to the south of the pumping station.

As part of the Uisce Éireann confirmation of feasibility received under CDS24008665, an upgrade is required to the existing foul network to accommodate the proposed site. The upgrade works include Sewer Network Upgrades downstream of the proposed development in order to facilitate this development. An upgrade of approx. 160 meters of existing sewer network to 200mm would need to be facilitated, with this upgrade to be funded by the developer. These details are to be confirmed by further studies.

Foul sewers have been designed and will be constructed in accordance with the Uisce Eireann 'Standard Details for Wastewater infrastructure' and 'Code of Practice for Wastewater Infrastructure'. In addition, foul sewers have been designed to the Building Regulations1997, as amended, (referred to within as 'the building Regulations') and specifically in accordance with the principles and methods set out in EN 752:2008 and DOE 'Recommendations for Site Development Works' (1998). In addition, HR Wallingford 'Tables for the hydraulic Design of Pipes, Sewers and Channels' and Water UK/WRc 'Sewers for Adoption – 6th Edition' have been applied.

2.3.8.2 Surface Water

The proposed network will outfall to the existing surface water drainage infrastructure. Subject to local authority approval the design intent is to connect into the existing surface drainage ditch, running west to east and passing the north of the site. Notably this open ditch, at the point of entry, is within the red-line boundary.

Part of the site works associated with this planning application will be to ensure the existing drainage ditch is to be made clean and clear to ensure continued proper water flow. This will include the removal accumulated debris, silt, vegetation, and any blockages along the drain and overgrown vegetation along the ditch edges to restore flow capacity.

Where works are to be carried out outside the site boundary, these will be done with appropriate consent from the land owner.

Surface water from the site will be collected and attenuated within the site curtilage, with a peak discharge rate of 2l/s/ha for the 1 in 100 Year rainfall event (including an allowance for climate change). As part of the development, several different SuDS measures will be provided to minimise the impact on water quality and water quantity of the runoff and maximise the amenity and biodiversity opportunities within the site.

The surface water system will be designed to accommodate a 1:100, 1:30 and 1:5-year storm event + 20% climate change without flooding any property. The remainder of the site will be attenuated through parking spaces with a permeable stone base which has been designed with a storage capacity for a 1:5, 1:30 and 1:100 storm event + 20% climate change. There is an

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outlet pipe to the main storm sewer after the storm water is attenuated through the permeable stone layers. All pipe velocities in the surface water pipeline are above 1m/s as shown in the accompanying calculations.

The proposed surface water drainage design has been discussed in more detail with the Engineering Services Report submitted as part of this application, under separate cover.

2.3.8.3 Sustainable Urban Drainage Systems (SuDS)

Sustainable drainage systems (SuDS) features incorporated in the design include green roofs, tree pits, swales, ponds, percolation areas, petrol interceptors and flow control devices in accordance with CIRIA publication C753 SuDS Manual. These design features will aid in managing rainwater close to where it falls, allow rainwater to soak into the ground, promote evapotranspiration, slow down and store runoff, treat runoff to reduce contamination through pollution prevention and controlling the runoff at source and reduce the risk of urban contaminants causing environmental pollution.

A full list of SuDS features is available in the Surface Water Management Plan/ Drainage Impact Assessment prepared by OSL Consulting Engineers under separate cover.

The proposed surface water drainage design has been discussed in more detail within the Engineering Report submitted as part of this application, under separate cover by OSL Consulting Engineers.

2.3.8.4 Water Supply

It is proposed that this development will be serviced by 150mm and 100mm diameter watermains and will include the provision of new fire hydrants and relevant infrastructure throughout the site. As part of the UE confirmation of feasibility received under CDS24008665, an upgrade is required to the existing water network to accommodate the proposed site. The aforementioned upgrade works include for part of the Uisce Éireann water network will have to be upgraded from 150mm to 200mm for approximately 200m. As Uisce Éireann currently do not have any plans to upgrade its network in this area, these works will be carried out by Uisce Éireann and the costs for this will be included in the connection fee.

All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Uisce Éireann 'Standard Details for Water Infrastructure' and 'Code of Practice for Water Infrastructure' and the department of the Environment's Building Regulations "Technical Guidance Document B – Fire Safety (2020)".

2.3.9 Services

2.3.9.1 Electrical Supply

In order to facilitate the new development the proposal is to install new electrical services to serve the houses and apartments. This involves the following:

- Rerouting the overhead lines underground.
- New Unit Substations
- New underground ducting and electrical infrastructure to serve the development.
- New underground ducting and electrical infrastructure to serve the development lighting.

2.3.9.2 Gas Supply

It is not proposed that gas is provided to the houses and apartments in the development.

2.3.9.3 Telecommunications

In order to facilitate the new development, the proposal is to install new underground ducting and telecommunications infrastructure to serve the houses and apartments.

2.3.9.4 Waste Management

An Operational Waste Management Plan (OWMP) prepared by AWN Consulting Engineers accompanies this application and should be referred to in conjunction with this section.

2.3.9.5 Climate Action and Energy

A Climate Action and Energy Statement has been prepared by OSL Consulting Engineers and is provided under separate cover with the application material.

2.3.9.6 Site Lighting

A public lighting strategy has been developed by Molloy Consulting and is provided under separate cover as part of the application material.

2.4 Construction Phase

This application is accompanied by an **Outline Construction Environmental Management Plan** (OCEMP), prepared by OSL Consulting Engineers, which should be read in conjunction with this chapter for a comprehensive description of the construction phase.

2.4.1 Programme

It is proposed, upon receiving a successful application, that there will be a possible number of phases of construction. The dwelling units will be developed on a sequential basis starting on the Western part of the site and generally moving sequentially. The anticipated start date of work on site is Q1/Q2 of 2026, starting with the site set up followed by the setting out and provision services. It is expected that the total duration of construction for the proposed works will be approximately 24 months. This timeframe is subject to change depending on several factors but can be considered an accurate estimate with information available as at the time of compiling this report.

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Figure 2.9 Construction Phasing Plan

2.4.2 Site Compound

The compound shall be entirely within the site boundaries. Site accommodation to be provided will include suitable washing/ dry room facilities for construction staff, canteen, sanitary facilities, first aid room, office accommodation etc. Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure.

The compound shall be constructed using a clean permeable stone finish and will be enclosed with security fencing. A permeable hardstand area will be provided for staff parking and these areas will be separate for designated machinery/plant parking.

A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.

A series of 'way finding' signage will be provided to route staff/deliveries into the site and to designated compound/ construction areas.

On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and sent do reuse as by-products or recovery at authorised facilities and the site compound area reinstate in full on completion of the works.

For more details please refer to the Construction Traffic Management Plan by MHL Consulting Engineers.

2.4.3 Construction Hours

For the duration of the proposed works the maximum working hours shall be 07:00 to 19:00 Monday to Friday (excluding bank holidays) and 07:00 to 16:00 on Saturday. No works are to take place on Sundays or Bank Holidays unless otherwise agreed in advance with the Planning Authority.

2.4.4 Construction Personnel & Parking

2.4.5 Construction Traffic

A **Construction Traffic Management Plan (CTMP)** prepared by MHL accompanies this application under separate cover.

This CTMP is a preliminary planning stage document that outlines strategies and measures to effectively manage, and control traffic associated with construction activities. It outlines traffic management planning items such as the transportation and movement of vehicles, equipment, and personnel during the construction phase of a project. The CTMP includes details about traffic routes, access points, parking arrangements, and measures to minimize the impact on local roads and communities. The aim is to ensure the safe and efficient flow of traffic, reduce disruptions to the surrounding area, and mitigate potential risks associated with construction-related transportation.

Currently the site can be accessed through the existing entrance to the Waterfall Heights development. For detailed junction photographs, please refer to the Appendix of the CTMP. Preliminary traffic routing proposals are set out in the CTMP. They outline construction traffic routing and interim residential traffic routing for the various construction stages within the construction phasing. The development road network has been carefully designed to provide adequate permeability for all road users during the operational stage.

Access is to be maintained at all times to leaseholds, private residents, and general local and public roads traffic. Arrival and egress of large HGVs to the site will require these vehicles to enter the site via the existing entrance, avoiding the nearby residential estates to the north.

The existing entrance will be used for all construction access /deliveries to the site but will be upgraded/enhanced to facilitate all future construction and operational access requirements. This may require its signalisation at an early stage, subject to approval by the local authority.

Traffic management, including a stop/go system, during peak HGV movements is to be implemented. Off-loading of materials such as concrete, precast concrete, structural steel, etc. is proposed alongside site construction traffic movements, mobile cranes, concrete pumping etc. During deliveries, the main internal access road will be 2-way and requiring that access be managed, particularly in the vicinity of the existing inhabited private residencies, pedestrian crossings, footpaths and at tight radius bends.

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The internal layout of the site to the various storage areas will have to be considered and carefully planned. This constraint will require that internal traffic management, particularly of large construction vehicles will have to be carefully managed within the site. The proposed site compound shall be located within the site boundary and positioned to ensure that deliveries, staff parking and visiting vehicles do not wait on the public road before entering the site as far as is practicable. The site set-up shall allow for adequate parking for all site staff within the confines of the proposed site boundary. No site vehicles will be permitted to park along the public roads or outside the working site boundary. The Main Contractor will provide a suitable secure area for all site personnel vehicles for the duration of the works.

The proposed external construction traffic haul route for all large deliveries to the site is as outlined in the appendix of the CTMP.

2.4.6 Earthworks

2.4.6.1 Ground Conditions

As detailed in Chapter 9 of this EIA, the site is primarily underlain by Sandstone with mudstone and siltstone (Gyleen Formation), and flaser-bedded sandstone and minor mudstone (Old Head Sandstone Formation).

Topsoils across the site are primarily fine loamy drifts with siliceous stones and coarse loamy drifts with siliceous stones, with made ground located adjacent to the eastern boundary and to the north, associated with the built-up areas of south-west Cork City.

2.4.6.2 Invasive Species

Invasive species surveys were incorporated into the above habitats and flora survey carried out at the Site on 11th April 2025. During this walkover, the location of invasive species, where they were encountered, was documented through the use of remote mapping software (QField), along with the extent of the area they cover. The invasive plant species survey primarily focused on plant species that are listed on Schedule III of the European Communities (Birds and Habitats) Regulations and considered to be 'High impact' invasive species e.g., Japanese Knotweed (Reynoutria japonica). Incidental observations of other terrestrial plant species known to be potentially invasive, such as Butterfly Bush (Buddleja davidii), were also recorded, where found.

Detailed mitigation measures will be presented in the final Biodiversity Chapter in relation to invasive species.

2.4.6.3 Waste

A Resource and Waste Management Plan (RWMP) has been prepared for construction phase of the proposed development and is submitted under separate cover with the planning application and should be read in conjunction with this section. This RWMP has been prepared by AWN Consulting Engineers. In addition, an Operational Waste Management Plan (OWMP) has been prepared by AWN Consulting Engineers.

The waste management objective will be to prevent waste arising in the first place, and to re-use, recycle or recover waste materials where possible. The Contractor will have the responsibility to record resource and waste management at the site in line with the RWMP and OWMP.

2.4.6.4 Bulk Excavation

According to the OCEMP, a specialist ground works contractor will be appointed to carry out the excavation and rock breaking works. The appointed specialist contractor will carry out a full risk assessment prior to the commencement of work.

The ground works operation will be carried out in order to ensure that material removed from the ground is taken away at regular intervals in order to reduce the amount of material that can be stored on site.

If required by condition imposed by the local authority, topsoil stripping associated with the proposed development will be monitored by a suitably qualified archaeologist, which will ensure the identification of any small archaeological features that may survive within the site. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation will be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH).

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will also be located so as not to necessitate double handling.

Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.

Similar to the management of stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.

2.5 Health and Safety

2.5.1 Construction Phase

A detailed Construction and Environmental Management Plan (CEMP), in line with the preliminary OCEMP submitted as part of this planning application, will be prepared and implemented by the contractor at the construction phase.

Works shall be performed in accordance with Statutory requirements, including Health, Safety and Welfare at Work (Construction) Regulations 2013 (S.I. no. 291 of 2013). The general principles outlined in the Health and Safety Authority document: 'Code of Practice for Avoiding Danger from Underground Services' will be followed to ensure the safety of workers and to minimise the risk of damage to any existing pipelines or buildings.

2.6 Commissioning

The testing and commissioning of services (drainage, watermain, gas, electricity) will be completed in accordance with relevant codes of practice as set out in **Chapter 7** of the EIAR.

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2.7 Decommissioning

The design life of the scheme is greater than 60 years. Thus, for the EIA process, the development is considered permanent, and a decommissioning phase is not considered in this report.

2.8 Conclusion

This chapter sets out the development parameters for the proposed development including an overview of the Architectural, Landscape and Engineering strategy. An overview of the phasing for construction has also been provided, and further information can be found in the Outline Construction and Environmental Management Plan and Construction Traffic Management Plan submitted under separate cover.

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CHAPTER THREE

ALTERNATIVES

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CHAPTER THREE

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CHAPTER 3 | Alternatives

3.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) was prepared to consider alternatives as required by Annex IV (2) of the Environmental Impact Assessment (EIA) Directive 201/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by EIA Directive 2014/52/EU (the "**EIA Directive**") and in Schedule 6 of the Planning and Development Regulations 2001, as amended, (PDRs) which states;

> *"A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment".*

The PDRs identify that reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics. The PDRs require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects be presented in the EIAR.

The Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022 states:

> *The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required.*

The Guidelines also state that the range of alternatives considered may include the 'do-nothing' alternative.

Notwithstanding the above, pursuant to Section 3.4.1 of the 2022 EPA Guidelines, the consideration of alternatives also needs to be cognisant of the fact that:

> *"in **some instances some of the alternatives described below will not be applicable** – e.g. there may be no relevant 'alternative location'…" (emp. added)*

The Guidelines are also instructive in stating:

> *"Analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR… It should be borne in mind that the amended Directive refers to 'reasonable alternatives… which are relevant to the proposed project and its specific characteristics'".*

This chapter of the EIAR provides an outline of the main alternatives examined for the proposed development and sets out the main reasons for choosing the development as proposed.

The assessment of alternatives is considered under the following headings:

i. 'Do-nothing' Alternative

ii. Alternative Locations

iii. Alternative Uses

iv. Alternative Project Design

3.2 Expertise and Qualifications

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master's in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 3 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR's, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, single 'one – off' developments, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

3.3 Consideration of Alternatives

3.3.1 Do Nothing

3.3.1.1 Actual Do Nothing

The 'Do-nothing' alternative is a general description of the evolution of the key environmental factors of the site and environs if the proposed project did not proceed. Each Chapter of this EIAR includes a description of the 'Do Nothing' alternative and should be referenced in conjunction with this Chapter.

The development site has been zoned for new residential development in the Cork City Development Plan 2022. It is a greenfield parcel of land situated in an area where there has been newly constructed residential development to the west. The site has access to infrastructure and services.

The site will connect into a new active travel route along the northern boundary of the site. This active travel route is permitted as part of the adjoining development to the west. The proposal also makes provision for potential future access to lands to the east of the site, which is to enable future pedestrian and vehicular activity.

In a 'Do-Nothing' scenario, the proposed development site would remain in its current condition, and it would not fulfil its residential zoning objective nor assist in the delivery of housing units at a period of national housing shortage. Accordingly, there would be an adverse impact on population, as this approach would fail to address the shortage of homes in Cork City. Maximising the efficiency of zoned and serviced residential land particularly when nationally, there is a housing crisis and as a result, the delivery of housing on zoned land in a timely manner is of critical importance.

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When compared with the proposed development, the key difference between the Do-Nothing and the proposed development is the delivery of new homes, and its consequential negative impact for population when compared with the alternative, the delivery of 246 new homes.

Under the Do-Nothing alternative, there would be no new residential neighbourhood within the proposed development site. However, this is likely to be short-term having regard to the fact that the site is zoned for residential development. The proposed development will change the character of the landscape and harmonise with the surrounding development. Any resulting impact of this can be managed by well-considered, high-quality design, that respects the setting.

To conclude, the Do-nothing alternative is an inappropriate and unsustainable approach that would result in the inefficient use of a strategically located and serviced zoned residential lands located in the suburbs of Cork City. With the mitigation measures proposed in this EIAR and having regard to the findings that no significant impacts on the environment are expected with such measures in place, the comparative environmental impacts are not considered sufficient to rule out the proposed development.

The primary likely significant environmental impacts of the proposed development are fully addressed in the relevant specialist Chapters of this EIAR. These impacts relate to Population & Human Health, Land & Soil, Water & Hydrology, Landscape & Visual, Noise & Vibration, as well as Air Quality & Climate associated with the proposed development.

The proposed development has the potential for cumulative, secondary, and indirect impacts, these can be difficult to quantify due to complex inter-relationships. All interactions and cumulative impacts have been addressed in Chapter 16 Significant Interactions with cumulative impacts and interactions fully addressed in the relevant specialist Chapters of this EIAR.

3.3.2 Alternative Locations

The Department of Housing, Planning and Local Government (2018) Guidelines for Planning Authorities and An Coimisiún Pleanála - states;

> *"The Directive requires that information provided by the developer in an EIAR shall include a description of the reasonable alternatives studied by the developer. These are reasonable alternatives which are relevant to the project and its specific characteristics. The developer must also indicate the main reasons for the option chosen taking into account the effects of the project on the environment. Reasonable alternatives may relate to matters such as project design, technology,* ***location****, size and scale.*
>
> *The type of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example,* ***some projects may be site specific so the consideration of alternative sites may not be relevant****. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. A 'mini- EIA' is not required for each alternative studied."*

We also refer to the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA. 2022), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location.

An alternative location would essentially result in a 'do nothing' scenario for the site.

3.3.3 Alternative Uses

The primary determinant of suitable uses is established in the site's zoning which are set out in the Cork City Development Plan 2022-2028. The majority of the proposed development site is zoned ZO 01 'Sustainable Residential Neighbourhoods' which has the objective '*to protect and provide for residential uses and amenities, local services and community, institutional, educational and civic uses'.* The Development Plan notes that the primary uses in this zone include residential uses, crèches, schools, home-based economic activity, open space and places of public worship.

A portion of the site to the southwest of the development is zoned ZO 02 'New Residential Neighbourhood' where it is an objective "*to provide for new residential development in tandem with the provision of the necessary social and physical infrastructure."*

As the site is zoned for residential use, the consideration of alternative (non-residential) uses is not applicable.

3.3.4 Alternative Processes

Due to the nature and scale of the proposed development (i.e. a residential development greater than 100 units) the only option is to submit a Large-Scale Residential Development planning application to Planning Authority. Therefore, there is no alternative process to consider.

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3.3.5 Alternative Design (including size & scale)

The layout of the proposed development went through a detailed design process with input from Cork City Council and the entire applicant's design team and the EIAR team.

3.3.5.1 Alternative Design No. 1 – Initial Sketch Design

Alternative Design No. 1 was developed as part of early development proposals prior to the submission of design proposals to Cork City Council. At this stage, the layout proposed to retain the existing historic hedgerow which runs north south through the centre of the site however, it did not propose to repurpose the historic laneway along this hedgerow and further consideration was needed in order to facilitate this. The layout was mainly orientated around a large open space to the north, with a smaller open space to the south. This again needed more consideration in order to distribute the open space more evenly across the site. Dwellings were orientated to work with the challenging levels on the site and to passively survey public open spaces throughout the site. Adequate distances between dwellings to limit overlooking was also provided. Pedestrian links through the site also needed to be developed further.

Table 3.1 Key Site Statistics – Alternative Design 1

Site Statistics	Alternative 1 – Initial Layout Developed
Site Area	5.4ha (gross) 5ha (net)
Total No. Units	242
Creche	Use of permitted creche
Density	48 units/ha
Open Space	15% of net site area



Figure 3.1 Alternative Design No. 1

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3.3.5.2 Alternative Design No. 2 – S.247 – Meeting held 03/03/25

Alternative Design No. 2 was presented to Cork City Council and discussed as part of the Section 247 pre-planning application meeting held on 3rd March 2025. This meeting was to discuss the Large Scale Residential Development Proposal. At this stage the proposal consisted of a total of 239 no. units at a density of 49 units/ha, along with the provision of 1 no. childcare facility to cater for both the permitted development to the west and any further development. A historic laneway running along the north-south hedgerow was incorporated into the active travel proposal for the scheme, with provisions made to connect it to the permitted active travel route to the north.

Provision for connectivity eastward was also included and designed into the proposal. An additional open space to the southeast was introduced and an urban edge formed along the north.

Further consideration was needed around the existing hedgerow, and it was suggested to form a large central open space which would give the hedgerow a hierarchy within the development.

The wayleave running east west through the site also restricted the ability to create strong urban blocks.

Table 3.2 Key Site Statistics – Alternative Design 2

Site Statistics	Alternative 2 – First Layout Submitted to Council
Site Area	5.73ha (gross) 4.95ha (net)
Total No. Units	239
Creche	140 childcare places
Density	49 units/ha
Open Space	15% of net site area



Figure 3.2 Alternative Design No. 2

The Council provided feedback on this layout including the following key points:

- Step buildings/street back from existing hedgerow
- Consider stronger urban block from throughout the site
- Stronger urban edge to the north
- Face units onto eastern boundary to allow connections where necessary

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3.3.5.3 Alternative Design No. 3 – S.32B – Meeting held 13/06/25

Alternative Design No. 3 was presented to Cork City Council and discussed as part of a Section 32B meeting with Cork City Council, held on 13th June 2025

At this stage the proposal consisted of 239 no. units. The density proposed was 50 units/ha and the layout continued to propose the construction of a 140-no. child creche. Usable open space was 15%.

The layout included a large central open space for which the existing historic hedgerow ran through. Units were stepped back to allow sufficient space for the retention of the hedgerow with strong urban block forms now created around central open space.

The apartment cluster was now proposed to the north of the scheme which formed a central communal open space for residents. Undercroft parking was also proposed for this area.

The layout of was adjusted to include for units to face onto the eastern boundary and create an urban edge with 3 no. connection points were indicated along this boundary.

Table 3.3 Key Site Statistics – Alternative Design 3

Site Statistics	Alternative 3 Submitted to Council for S.32B
Site Area	5.76ha (gross0 4.8ha (net)
Total No. Units	239
Creche	140 childcare places
Density	50 units/ha
Open Space	15% of net site area



Figure 3.3 Alternative Design No. 3

The Council provided feedback on the layout presented at S.32B which inclueded the following key points:

- Consider relocating access ramp to apartment parking to eastern side;
- Introduce higher scale units to the south of apartments to help transitions – extend apartment character area;
- Consider street surface finish on street south of apartments

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3.3.5.4 Final Design – Submitted for Planning

The final Design directly responds to the Council's comments and is overall an accumulation of high-quality design stemming from the design/EIA team input and feedback from Cork City Council throughout the planning process.

The layout proposed includes 246 no. units with a density of 51.3 units/ha. Usable open space measures 15%.

All of the comments suggested by the Council following the S.32B meeting were addressed. The introduction of duplex apartments to the south of the apartments units resulted in the increase of 7 no. units from the previous layout presented at S.32B stage. The access ramp to the undercroft car park was relocated to the east of the apartments with an innovative landscaping design included to transition between the communal plaza and the open space to the west of the apartments.

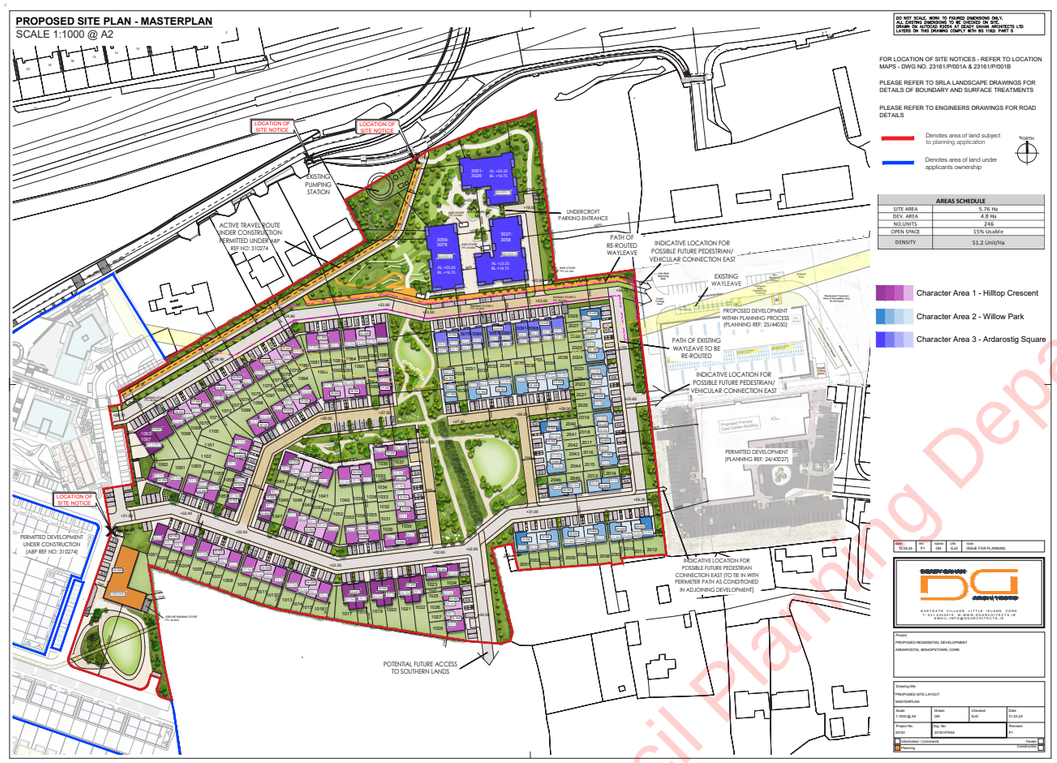


Figure 3.4 Final Site Plan

Table 3.4 Key Site Statistics – Final Design

Site Statistics	Final Design – Submitted to Council for Planning
Site Area	5.76ha (gross) 4.8ha (net)
Total No. Units	246
Creche	140 childcare places
Density	51.3 units/ha
Open Space	15% of net site area

3.4 Difficulties Encountered

There were no difficulties encountered in the preparation of this assessment for the proposed development.

3.5 Conclusion

On the basis of the foregoing, it is considered that all reasonable alternatives to the project are considered, and no alternatives have been overlooked which would significantly reduce or further minimise environmental effects. Having considered all alternatives, the final design chosen by the applicant as presented is deemed to be the most suitable project for the site.

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CHAPTER FOUR

POPULATION & HUMAN HEALTH

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McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

Cork City Council Planning Department. For Inspection Purposes Only!

CHAPTER FOUR

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CHAPTER 4 | Population & Human Health

4.1 Introduction

According to the European Commission's Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017), human health is; *"a very broad factor that would be highly project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population."*

The Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022) advise that "*in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc.*"

This chapter addresses the likely significant environmental impacts of the proposed development on population and human health. It is noted that other chapters of the EIAR also deal with likely significant environmental effects on population and human health arising from traffic and transportation, air quality and climate, noise and vibration, landscape and visual, material assets: utilities and the risk of major accidents and/or disasters and those chapters should be referenced in conjunction with this chapter of the EIAR.

4.2 Expertise and Qualifications

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master's in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 3 years of experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR's, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, including a Large-Scale Residential Development located on Mountain Road, Carrigaline, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

4.3 Proposed Development

A full description of the proposed development is provided in **Chapter 2** of this EIAR. To summarise, the proposed development consists of a Large-Scale Residential Development (LRD) which consists of the construction of 246 no. residential units, a creche and all associated site development works at Ardarostig (Townland), Bishopstown, Cork.

4.4 Methodology

This chapter has been prepared pursuant to Schedule 6 of the Planning and Development Regulations 2001 (as amended). Section 2 of Schedule 6 sets out the additional information relevant to the specific characteristics of the project required, which includes a description of the likely significant effects on the environment of the proposed development resulting from, among other things;

> *(IV) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters).*

The Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) state that:

> *"… in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g., under the environmental factors of air, water, soil, etc."*

Recital 22 to the EIA Directive provides that:

> *"in order to ensure a high level of protection of the environment and human health, screening procedures and environmental impact assessments should take account of the impact of the whole project in question, including, where relevant, its subsurface and underground, during the construction, operational and, where relevant, demolition phases."*

The EPA Advice Notes (EPA 2003) recommend considering the following issues when assessing the potential impacts and effects of a proposed development on Population and Human Health:

- Economic Activity Likely to Lead to Projects – Will the development stimulate additional development and/or reduce economic activity, and if either, what type, how much and where?
- Social Consideration – will the development change the intensity of patterns and types of activities and land use?
- Land Use – will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately alter the character and use of the surroundings?
- Tourism – will the development affect the tourism profile of the area?
- Health – have the vectors through which human health impacts could be caused been assessed, including adequate consideration of inter relationships between those assessments.

4.4.1 Relevant Legislation & Guidance

Publications and other data sources consulted include:

- Revised National Planning Framework Ireland 2040 – Our Plan
- Southern Regional Spatial and Economic Strategy 2019-2031;
- Cork City Development Plan 2022-2028;
- Central Statistics Office (CSO) website www.cso.ie;
- Department of Education (DE) website https://www.gov.ie/en/organisation/department-of-education/;
- Pobal website https://maps.pobal.ie/; and
- Health and Safety Authority website https://hsa.ie.

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Additionally, reports prepared by McCutcheon Halley Planning Consultants included with this application under separate cover were consulted, as follows:

- Childcare Demand Report;
- School Demand Assessment Report;
- Social Infrastructure Audit; and
- Planning Report.

This chapter has been prepared having regard to the following guidelines:

- Guidelines for Planning Authorities and An Coimisiún Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

The impact assessment section of this chapter follows the terminology (where applicable) used in the EPA Guidelines as set out in Chapter 1 of this EIAR.

4.5 Baseline Environment

4.5.1 Application Area

The site, which is 5.76 hectares in area, with a net developable area of 4.8 hectares, is located within the extended Cork City development boundary within the Southwestern Suburbs, to the south of the Bandon Road (N71) and N40 South Ring Road.

The subject site is situated approximately 6.1km southwest of Cork City Centre (15 minutes' drive), 2.5km southwest of Wilton Shopping Centre (8 minutes' drive) and 1.1km west of Bishopstown Court Neighbourhood Centre.



Figure 4.1 Application Area and Surrounding Context

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4.5.2 Land Use Zoning

The subject site is primarily zoned ZO 01 'Sustainable Residential Neighbourhood' where the following objective applies:

> *"To protect and provide for residential uses and amenities, local services and community, institutional, educational and civic uses."*

Paragraph ZO 1.1 outlines that "the provision and protection of residential uses and residential amenity is a central objective of this zoning." With paragraph ZO 1.2 highlighting that development within this zone should generally respect the character and scale of the neighbourhood it is situated in.

A portion of the site to the southwest of the development 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."*

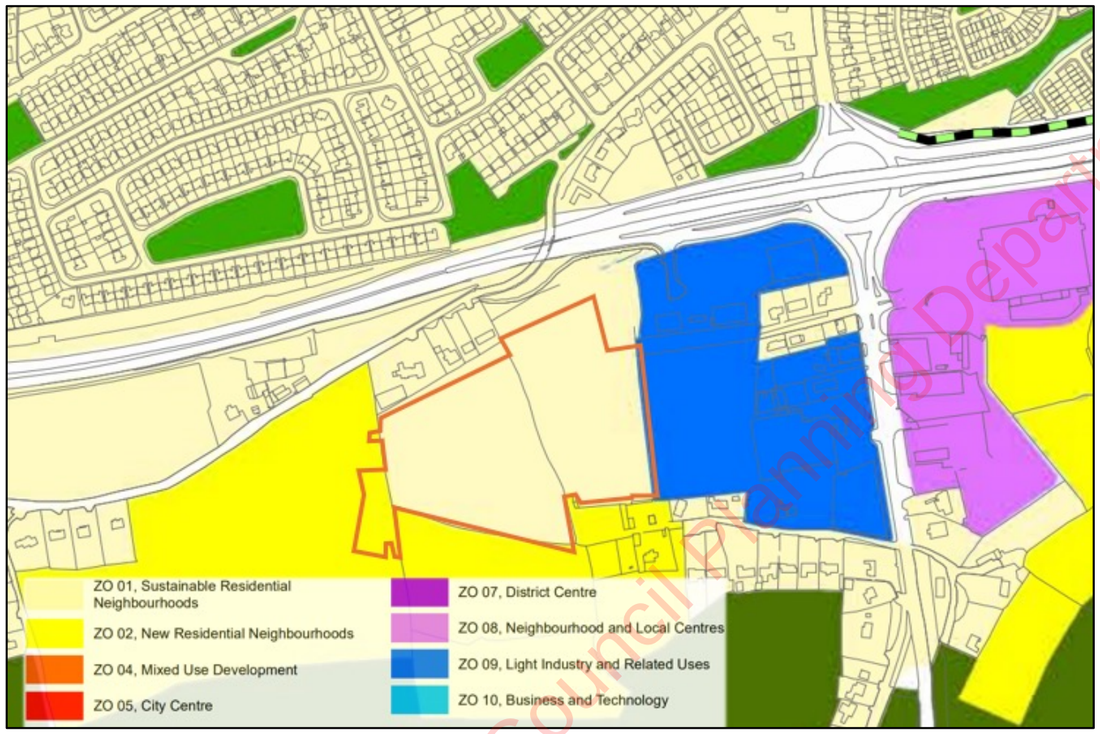


Figure 4.2 Site Zoning from the Development Plan (outlined in orange).

4.5.3 Surrounding Land Uses

The site is bounded by the Waterfall Road/N40 and 4 no. dwellings to the north, light industrial uses to the east, agricultural land to the south and a residential development to the west, which is currently under construction. Access to the proposed development is to the west along Waterfall Road via the adjoining Waterfall Heights residential development. Permission has recently been granted for the construction of a Primary Care Centre on lands to the east of the site.

The site is within a short walking distance of nearby bus stops, which is served by the 208-bus service along Curraheen Road (1.1km from the site), and the 236-bus service along Bishopstown Road (600 m from the site), both providing direct access to Cork City. Additional bus stops with more frequent public transport facilities are available along Curraheen Road.

The site is located nearby to sporting and amenity facilities, retail opportunities and third level education institutions, making it an attractive area to provide new residential development.

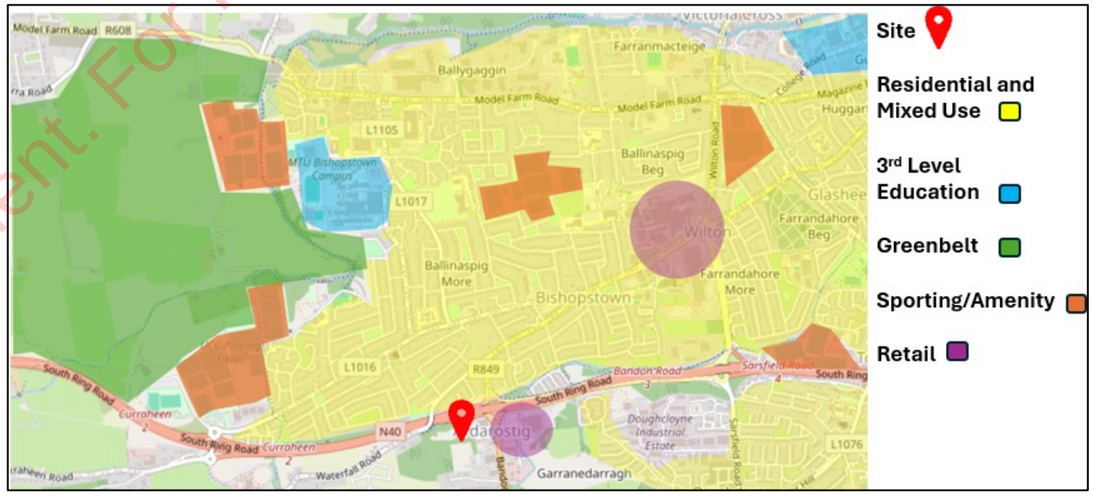


Figure 4.3 Site location and Surrounding Context

4.5.4 Sensitive Receptor

For the purpose of this chapter, the primary sensitive receptors are:

I. Residential Areas in Proximity;
II. Community Facilities and Services;
III. Local Amenity;
IV. Economic Activities.

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There are existing and future residential properties which have the potential to be impacted by the development, specifically the residents of:

V. Residential dwellings Waterfall Road. and;

VI. Residents of adjoining Waterfall Heights estate;

4.5.5 Public Transport and Accessibly

The site is within a short walking distance of nearby bus stops, which is served by the 208-bus service along Curraheen Road (1.1km from the site), and the 236-bus service along Bishopstown Road (600 m from the site), both providing direct access to Cork City. Additional bus stops with more frequent public transport facilities are available along the Curraheen Road.

In addition, the site is strategically located to benefit from a new public transport network to be delivered from Cork BusConnects. There have been delays to the implementation of this network update, however it is anticipated that the rollout of new bus routes and timetables will be delivered in 2026/2027. This would see the introduction of a high frequency bus service located within a 15 minute walk of the site and the provision of the 11-bus service which will include services along the Waterfall Road (See Figure 4.4).

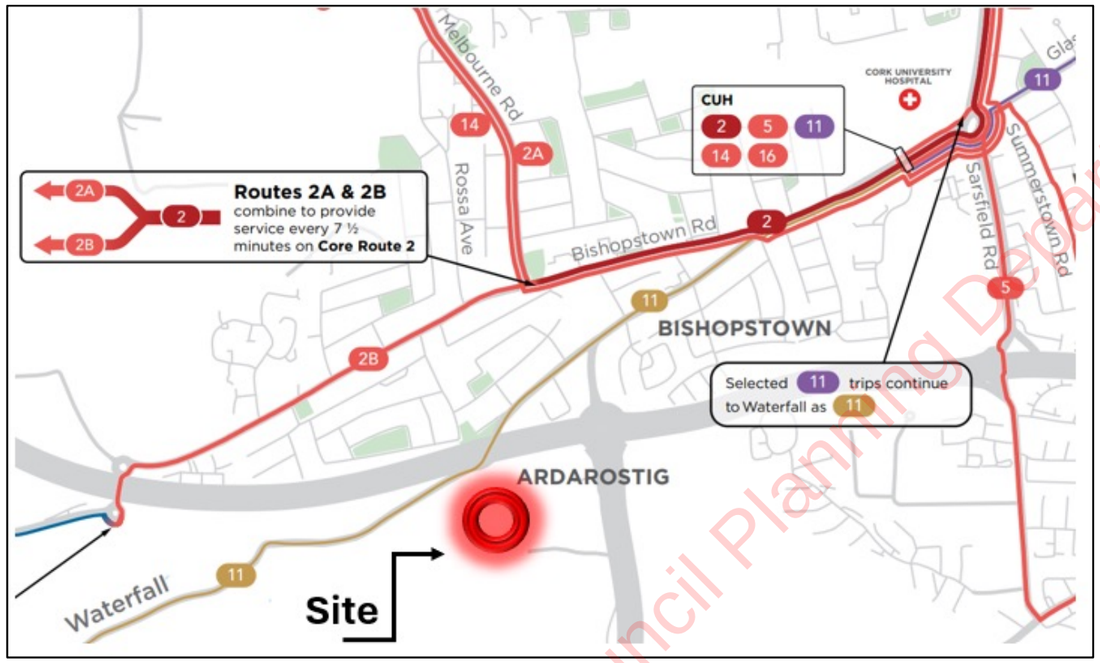


Figure 4.4 Public Transport as per Cork BusConnects proposals for 2026/27

As per the Traffic and Transport Assessment prepared and submitted by MHL Consulting Engineers, as part of the adjoining Waterfall Heights site, the connectivity to/through the area has been addressed carefully. The Waterfall Road is being significantly enhanced and widened, with urban gateway features at either end of the development, which are compliant to DMURS. The footpath along the south of Waterfall Road is also to be extended to link from the N40 overbridge to the development site.

The proposed development site is to be accessed via Waterfall Heights and will integrate with the upgrades along Waterfall Road. Future pedestrian/cycle connectivity to the N71 from the eastern boundary of the site is also a possibility in the future and would provide residents with a safe and sustainable means of travelling to local amenities, such as Dunnes Stores.

A safe cycle route is to be constructed as part of the Waterfall Heights development; this route is on the southern side of Waterfall Road through Waterfall Heights and then heads east. This cycle route is in the form of a 3m wide two-way cycle track along the southern side of the Waterfall Road which the development site will benefit from. An indicative outline of this cycle route is shown in the figure below, imposed on the Cork Cycle Connects Metropolitan Area Network.



Figure 4.5 Outline of Cycle Route to be constructed along Waterfall Road

4.5.6 Air Quality

The interactions between air quality and population and human health have been considered, as the operational phase may pose health risks due to dust nuisances and potential traffic-related air pollutants. However, the mitigation measures employed at the proposed development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic related pollutants have been assessed and determined as not significant, therefore, air quality impact from the proposed development are not expected to have a significant impact on population and human health.

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4.5.7 Population

This section reviews the demographic characteristics, population, and age structure of areas surrounding the development site. The demographic profile of the Small Areas within the study area (2km) have been examined with the use of CSO Census of Population Statistics dated 2022. A radius of 2km has been selected for consistency, with the Childcare Demand Report and the School Demand Report submitted under separate cover using this measurement tool. The use of CSO 2022 data presented within this section reflects the most recent data available to the public. Figure 4.6 represents the area of study.

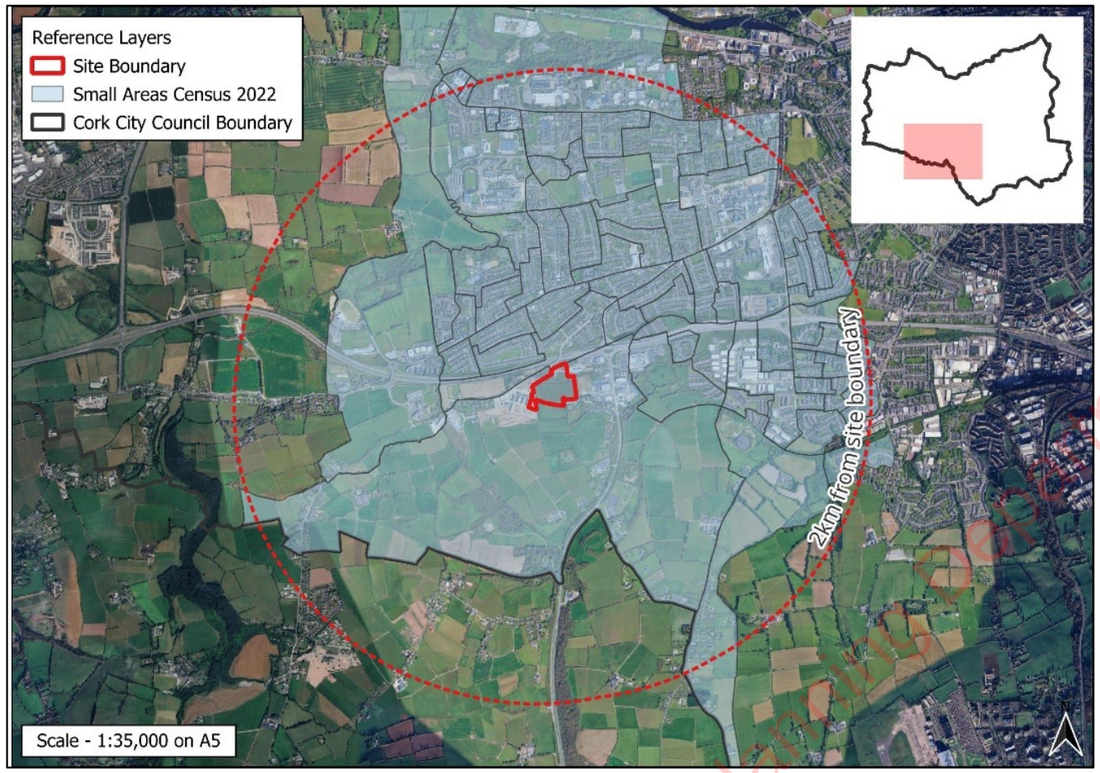


Figure 4.6 Electoral Divisions in the Study Area

The population of the study area increased from 17,136 in 2016 to 17,713 in 2022 which represents an increase of 3.4%. In 2022, 4.9% of the total population were of pre-school going age (i.e. 0-4 years), representing a 14.1% decrease compared to the 2016 Census for the same age group.

By way of comparison, 19.7% of the population were over the age of 65 in 2022 which was higher than the proportion for both Cork City (14.9%) and the state (15.1%) recorded. Approximately 14.1% (i.e. 2,489) of the population were aged between 30-39 which was lower than both the proportion of 30-39-year-olds recorded for Cork City (15.6%) and the state (13.9%).

The largest age cohorts all centre around a range of 20-34 years, with this accounting for approximately 35% of the population within the study area. By comparison, the percentage of the population aged 0-14 years within the area is just 15%. This could suggest that younger adults are being forced to continue to reside in their family home, resulting in a reduction in the number of newborns. This would indicate that there is an urgent requirement to continue to provide new homes in the area, which will enable younger adults to buy their own homes and start families.

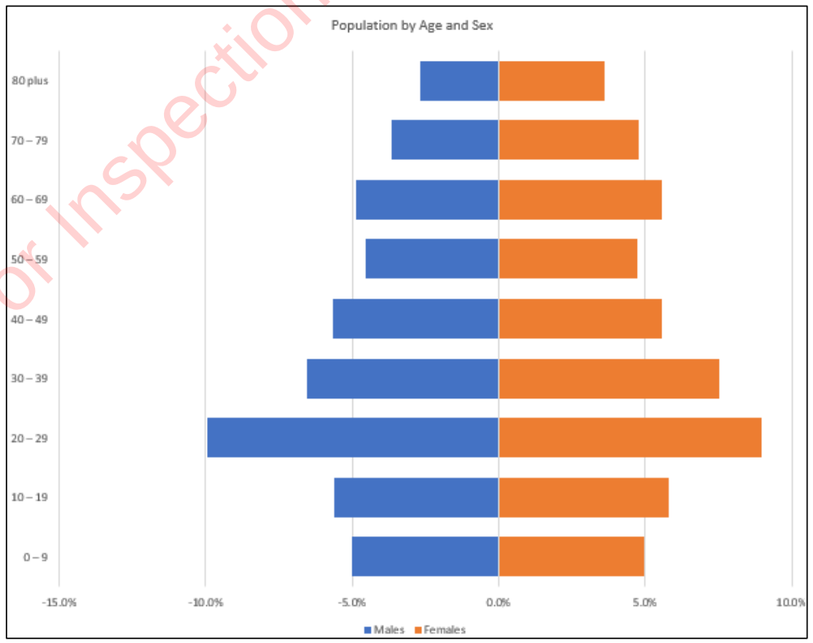


Figure 4.7 Population Pyramid for Study Area (Source: Census 2022).

Table 4.1 below provides a full analysis of population changes across all age cohorts between the 2016 and 2022 Census for the study area.

Given the clear evidence of a sustained young adult presence and increasing population numbers, well-planned residential infrastructure will play a key role in fostering a thriving and dynamic community that continues to attract new residents while retaining existing ones.

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Table 4.1 Population Change from Census 2016-2022.

Population aged 0 - 19 by sex and year of age, persons aged 20	Study Area		
Persons	2016 (#)	2022 (#)	Change
Age 0 - 4	1,004	862	-14.1%
Age 5 - 9	859	898	4.5%
Age 10 - 14	674	893	32.5%
Age 15 - 19	1,055	1,129	7.0%
Age 20 - 24	2,015	1,806	-10.4%
Age 25 - 29	1,524	1,547	1.5%
Age 30 - 34	1,378	1,267	-8.1%
Age 35 - 39	1,118	1,222	9.3%
Age 40 - 44	887	1,050	18.4%
Age 45 - 49	768	935	21.7%
Age 50 - 54	945	742	-21.5%
Age 55 - 59	964	901	-6.5%
Age 60 - 64	869	978	12.5%
Age 65 - 69	796	872	9.5%
Age 70 - 74	776	790	1.8%
Age 75 - 79	624	703	12.7%
Age 80 - 84	491	584	18.9%
Age 85 and over	389	534	37.3%
Total	17,136	17,713	3.4%

Table 4.2 Breakdown of the Population by Age Cohort (Source: CSO)

Age Cohorts (Years)	Cumulative Study Area	
	Population	Age Cohorts Percentage
0-4	862	4.9%
5-9	898	5.1%
10-14	893	5.0%
15-19	1,129	6.4%
20-24	1,806	10.2%
25-29	1,547	8.7%
30-34	1,267	7.2%
35-39	1,222	6.9%
40-44	1,050	5.9%
45-49	935	5.3%
50-54	742	4.2%
55-59	901	5.1%
60-64	978	5.5%
65-69	872	4.9%
70-74	790	4.5%
75-79	703	4.0%
80-84	584	3.3%
85 and over	534	3.0%
Total	**17,713**	**100%**

4.5.8 Deprivation Index

The Pobal Deprivation Index is Ireland's most widely used social gradient metric, which scores areas in terms of affluence or disadvantage. The index uses information from Ireland's census, such as employment, age profile and educational attainment, to calculate this score.

Figure 4.8 shows the level of affluence and deprivation at the Small Area level, within the study area according to the Pobal HP Deprivation Index. Scores range from -20 (Very Disadvantaged) to +17 (Affluent). According to the 2022 Pobal HP Deprivation Index, Cork has an average deprivation score of 2.69, which is notably higher (indicating more affluence) than the national average of 0.56. The figure below illustrates that the development site is situated in an affluent area, with a mix of marginally above average to the north and affluent areas to the east. Overall, the site is located within a relatively affluent area.

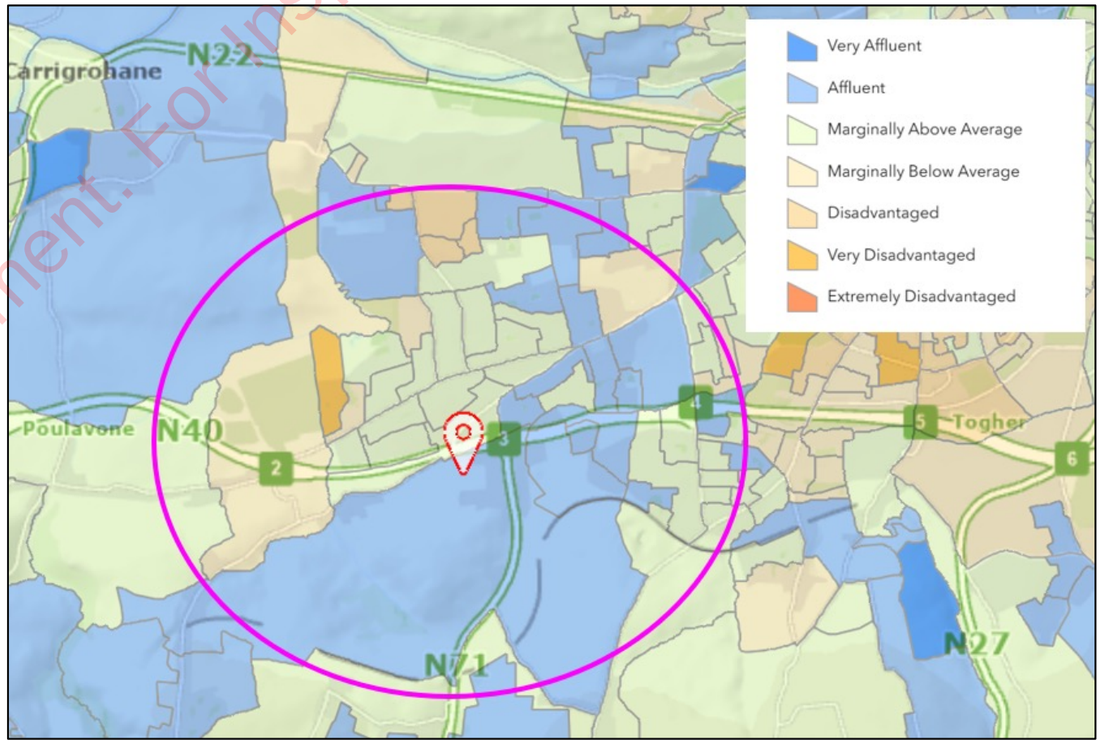


Figure 4.8 Deprivation Index

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4.5.9 Households

The CSO Census data reveals trends in relation to household types across both the 2016 and 2022 Census', revealing trends and patterns which provide insights into household composition. The statistics reveal that the study area comprises a large proportion of 1 and 2 person households, with these household types amounting to 53.9% of those total households in the study area. While this may seem significant, it largely aligns with household type data at both the national level (52.1%) and Cork City (55%). According to the data from both the 2016 and 2022 Census, the number of 1 person households has risen by 1.5% during the inter-census period, while the number of 2-person houses has risen by 1.8% over the same timeframe.

This trend is reflective of the overall sentiment nationally that household sizes are reducing, subsequently creating a demand for new homes which cater for smaller households. While the number of 3-person households decreased slightly (2.4%) in the study area between 2016-2022 to 18% of the total household composition, this remains the third highest household size, behind 1 and 2 person households. This would suggest that future development in the area should cater for 1-3 person households. Notwithstanding this, given the observation provided in Section 4.5.7 of this Chapter, it is also likely that there is a young adult population continuing to reside in the family home, awaiting opportunities in the housing market to be able to purchase their own home and start their own families. In this context it is important to hold a long-term household forecasting perspective and ensure that opportunities are provided for household sizes of 4+ persons. Notably, the largest change in household size was seen in 4-person households, which increased by 7.2% between 2016-2022.

Overall, the population is growing, but household sizes are shrinking, pointing to a shift in living preferences and the need for adaptable housing solutions that cater to smaller and more mobile household structures. Table 4-3 below highlights the household composition for the study area and notes the changes over the inter-census period.

Table 4.3 Census 2016, 1-2 Person Households

Private households by size	Study Area			
Households	2016 (#)	2022 (#)	Change	2022 (%)
1 person households	1,423	1,444	1.5%	23.1%
2 person households	1,892	1,927	1.8%	30.8%
3 person households	1,156	1,128	-2.4%	18.0%
4 person households	970	1,040	7.2%	16.6%
5 person households	493	508	3.0%	8.1%
6 person households	157	151	-3.8%	2.4%
7 person households	36	37	2.8%	0.6%
8 or more persons households	18	19	5.6%	0.3%
Total households	6,145	6,254		100.0%

4.5.10 Housing Delivery

The Department of Housing Planning and Local Government, on behalf of the Government, prepared and published the National Planning Framework (NPF) under Project Ireland 2040, the overarching policy and planning framework for the social, economic, and cultural development of our country.

On the 8th of April 2025, the Government approved the Revised National Planning Framework (NPF) which, will create the conditions for accelerated housing delivery in Ireland. This follows a comprehensive NPF revision process which has been underway since June 2023 and the publication of a population projections report by the Economic and Social Research Institute (ERSI).

As part of the overall target population growth between now and 2040, the NPF indicates a projected increase in population to 6.1 million persons, an increase of 300,000 compared to the original NPF estimate.

National Policy Objective 42 outlines its plan to target the delivery of housing to accommodate approximately 50,000 additional homes per annum by 2040. The NPF Sets a specific target of 303,000 new homes between 2025 and 2030, averaging over 50,500 units per year, with a gradual increase from 41,000 units in 2025 to 60,000 units by 2030.

According to the revised NPF, the population of Cork City and Suburbs is expected to rise to a minimum of 320,000 persons, representing an increase of 40% from the population recorded in 2022.

Despite these revised targets, current housing delivery is falling short. According to the CSO New Dwelling Completions Q4 2024 Report, only 30,330 new dwellings were completed in 2024—a 6.7% decrease from 2023 and below the *Housing for All* annual target of 33,000 homes. Within this total, the number of scheme dwellings increased by 4.6% to 16,200, while single dwellings declined slightly by 2.2% to 5,367. Apartment completions, which are particularly relevant in urban housing supply, made up 28.9% of new housing in 2024, with scheme dwellings accounting for 53.4% and single dwellings at 17.7%.

The ongoing shortfall in housing supply, particularly in high-demand urban areas, highlights the urgency to address the situation with immediate effect. This is reflected in the ongoing commentary regarding the anticipated failure to meet the housing targets outlined by the revised NPF in 2025 and 2026.

The population and housing stock change for the study area between the 2016 and 2022 Censuses are shown below and highlight the significant shortfall in new households between 2016-2022 in the context of the requirements for 2040.

Table 4.4 Population and Housing in Study Area (Source: CSO)

	2016	2022	6-year change
Total Population	17,136	17,713	3.3%
Housing Stock	6,145	6,254	1.77%

4.5.11 Tenure

A majority of households in the study area comprise of persons who either own their own homes outright or own with a mortgage or loan. According to Census 2022 data, 40.4% of households fall into the former of these categories while an additional 17.4% fall into the latter. The figure for owned outright dwellings suggests that there is a high number of households who are long-established in the area and who have purchased their homes some years ago.

When compared to the 2016 Census information, the number of households owned outright has increased slightly over the inter-census period, rising by 1.7%. The number of households rented from a private landlord has seen higher increases, rising 2.8%, with 30.2% of all households representing rented private properties. This is considerably higher in the study area when compared to both Cork City (32.6%) and the national figure (18%), suggesting that persons in the area are being forced to rent in the absence of new homes coming to the private market for purchase.

Lower amounts of properties are being rented from Local Authorities within the study area compared to statistics for both Cork City and the national average. 5.8% of households account for this, with an additional 1.3% of households being rented from a housing body.

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Figure 4.9 and Table 4-5 illustrate the recent trends in household type from 2016-2022.

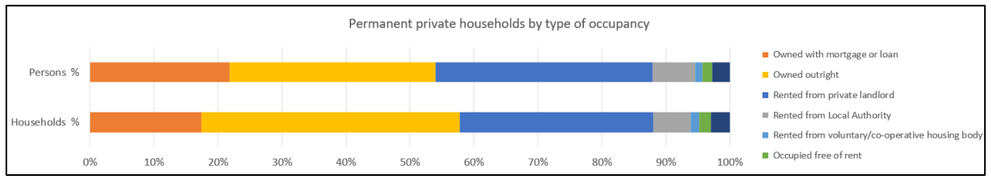


Figure 4.9 Percentage of people and households according to occupancy type, Study Area, 2022. (Source: CSO)

Table 4.5 Percentage of households according to occupancy type, Study Area 2016-2022. (Source: CSO).

Permanent private households by type of occupancy	Study Area			
Households	2016 (#)	2022 (#)	Change	2022 (%)
Owned with mortgage or loan	1,106	1,084	-2.0%	17.4%
Owned outright	2,483	2,524	1.7%	40.4%
Rented from private landlord	1,835	1,886	2.8%	30.2%
Rented from Local Authority	395	365	-7.6%	5.8%
Rented from voluntary/co-operative housing body	57	81	42.1%	1.3%
Occupied free of rent	87	113	29.9%	1.8%
Not stated	168	189	12.5%	3.0%
Total	6,131	6,242		100.0%

4.5.12 Employment

The study area indicates that majority of persons are currently working, with 50.2% identifying that they are currently employed in Census 2022. This is a 9.4% increase compared to the same status from the 2016 Census, with more persons in the area employed from the latest data set. The student population in the area is higher on average than the average across Cork City and higher again than the national average. According to the results from the 2022 Census, the proportion of persons within the population of the study area who have identified their principal status as 'student' is 16%. This is higher than both Cork City (12.5%) and the national average (11.1%).

The number of individuals identified as retired increased by 12% over the inter-census period, with 20.1% of the study area's population reporting this status in the 2022 Census. This is a relatively high number of retirees making up the study population and is approximately one third above the national retired population of 15.9%.

The increased number of retirees reflects an ageing population and new housing development which create opportunities for downsizing may be attractive to these persons.

Table 4.6 Principal Status of Population, Study Area 2016-2022. (Source: CSO).

Population aged 15 years and over by principal economic statu	Study Area			
Persons	2016 (#)	2022 (#)	Change	2022 (%)
At work	6,913	7,560	9.4%	50.2%
Looking for first regular job	93	104	11.8%	0.7%
Unemployed having lost or given up previous job	701	421	-39.9%	2.8%
Student	2,590	2,416	-6.7%	16.0%
Looking after home/family	990	907	-8.4%	6.0%
Retired	2,704	3,029	12.0%	20.1%
Unable to work due to permanent sickness or disability	559	526	-5.9%	3.5%
Other	49	97	98.0%	0.6%
Total	14,599	15,060		100.0%

Census 2022 statistics also provide information in relation to commuting patterns for the population. According to the results obtained from the study area, over 70% of the population aged 5 years and over commute to work/school within a 30-minute time period. This is above the average across Cork City and the nation, suggesting that the study area is located close to both employment locations and educational institutions.

Of those who commute, 36% have indicated that they complete their journey by foot, with 12.8% using public transport. This suggests that schools and employment locations are highly accessible and that sustainable travel options are available.

Table 4.7 Commuting times to work and school of study area population. (Source: CSO).

Commuters	2016 (#)	2022 (#)	Change	2022 (%)
Under 15 mins	3,711	3,384	-8.8%	31.7%
1/4 hour - under 1/2 hour	4,263	4,221	-1.0%	39.5%
1/2 hour - under 3/4 hour	1,587	1,608	1.3%	15.0%
3/4 hour - under 1 hour	241	250	3.7%	2.3%
1 hour - under 1 1/2 hours	206	226	9.7%	2.1%
1 1/2 hours and over	86	106	23.3%	1.0%
Not stated	626	892	42.5%	8.3%
Total	10,720	10,687		100.0%

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4.5.13 Social Infrastructure

Social infrastructure includes a wide range of services and facilities, including education, health, community, cultural, play, faith, recreation and sports facilities that contribute to the quality of life. The LRD planning application is accompanied by a **Social Infrastructure Audit (SIA**) **Childcare Demand Report (CDR)** and a **School Demand Assessment (SDA)**, which should all be read in conjunction with this chapter. In summary, these reports confirm that sufficient facilities are available in the area and that these facilities can adequately provide for the new population anticipated as part of this development. In addition, this Chapter details information on nearby healthcare, recreation and retail facilities in the area.

4.5.13.1 Education and Childcare

The Childcare Demand Report (CDR), which accompanies this application (under separate cover), has identified a total of 7 no. childcare facilities within the 2km Study Area buffer. The location of these providers, and their current available capacity, in the context of the site are shown in Table 4.8, with corresponding Figure.

Table 4.8 Childcare Providers, distance to site and capacity of provider

No.	Service Name	Distance to Site (km)	Distance to Facility Drive Time (Mins)	Capacity of Facility (Places)
1	A Step on the Ladder	1.7	6	22
2	Bishopstown Community Pre School	0.8	5	44
3	Cheeky Cherubs Early Years Schools - Bishopstown	0.5	3	40
4	First Steps Montessori & Daycare	0.9	4	76
5	Horizons Montessori	0.5	2	66
6	Montessori Scoil an Spioraid Naoimh	0.6	2	22
7	Naíonra Thigh Wilton	1.2	4	22
	Total			292

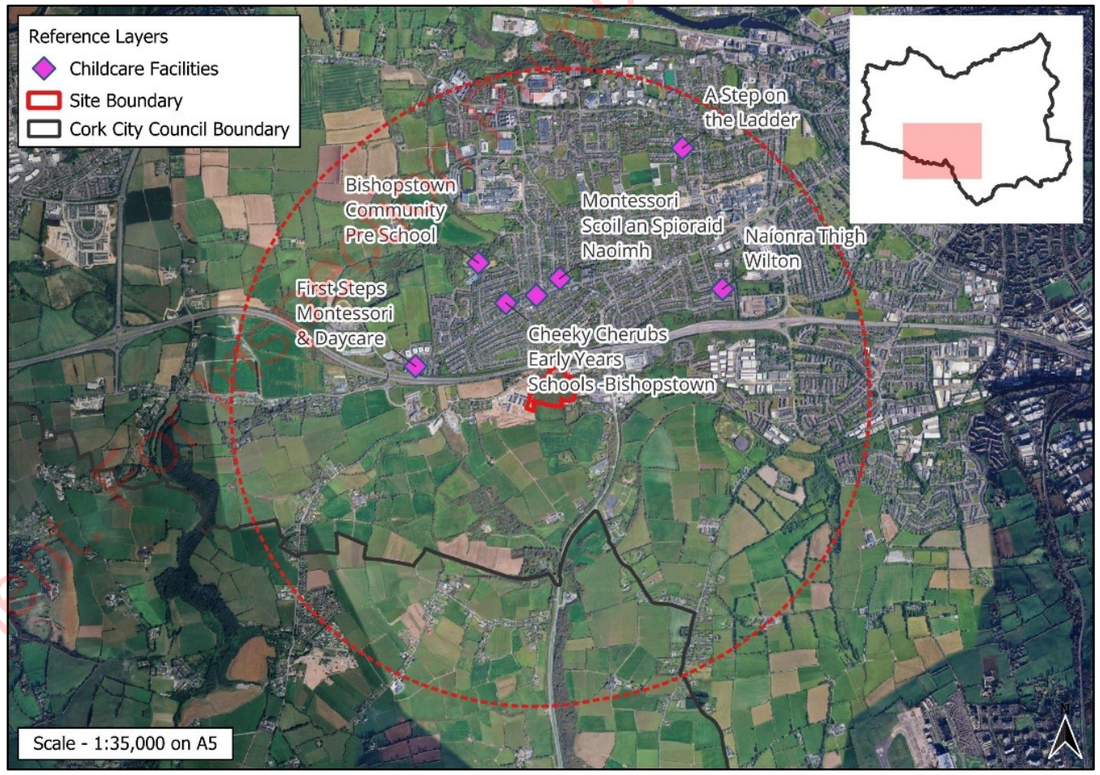


Figure 4.10 Location of identified childcare providers within the Study Area

It is important to note that the proposed development includes the provision of 1 no. childcare facility on site which has the capacity to cater for both the adjacent Waterfall Heights development and the proposed development. The childcare facility will result in the creation of 140 childcare places.

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4.5.13.2 Primary and Post Primary Schools

The School Demand Assessment (SDA) that accompanies the planning application has identified the primary, post primary and special schools which are available within a 2km radius of the site. The result shows that there are 8 no. primary schools and 3 no. post-primary schools located within 2km of the subject site. A list of the schools in the area are found in the SDA. Within the 25min walking buffer of the site there are 3 no. primary schools, 2 no. special schools and 2 no. post-primary schools located within the area. The SDA outlines the enrolment figures for the schools located within the 2km radius of the site. Figure 4.11 highlights the location of the schools within a 15 and 25 minute walk of the site, with a full list of the nearby schools found in the SDA. Table 4.9 reflects the schools identified in the SDA and their proximity to the development site.



Figure 4.11 Schools in Study Area

Table 4.9 Schools in Study Area (2km) as per the SDA

No.	Educational Establishment	Distance from Site (Km)	Travel Time by Car (mins)
	Primary School		
1	Scoil Baile Nora	4km	6 min
2	Scoil an Spioraid Naomh	1.6km	4 min
3	Scoil an Spioraid Naomh, Cailíní	1.2km	3 min
4	St. Catherines National School	3.3km	9 min
5	Gaelscoil Ui Riada	2.2km	5 min
6	Scoil Mhuire Gan Small B	3.6km	9 min
7	Scoil an Athair Maitiu C	3.8km	8 min
8	Togher Boys National School	3.8km	8 min
	Post-Primary		
1	Bishopstown Community School	1.8km	4 min
2	Coláiste an Spioraid Naoimh	1.7km	3 min
3	Mount Mercy College	3.6km	8 min

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4.5.13.3 Third Level Education

The development site is strategically located in the context of access to third-level education institutions. Munster Technological University (MTU) is situated to the north of the site, within the study area. This means that the University can be accessed on foot, within approximately 25 minutes. Located slightly outside the study area is University College Cork (UCC), which is the most attended of the two third-level institutions in Cork. Both MTU and UCC offer a broad range of courses, from Level 7 (Undergraduate Degree) to Level 9 (Masters Degree). In addition, the site is located within a short distance of Cork College of Further Education (formerly known as Coláiste Stiofáin Naofa). This is a further education college which provides a number of Level 5 and Level 6 courses available to students following completion of their Leaving Certificate.



Figure 4.12 Third Level Institutions

Table 4.10 Third level Institutions in Study Area

No.	Educational Establishment	Distance to Site	Travel Time by Car (Mins)
	Third Level Education		
1	Munster Technological University	2.1km	4
2	University College Cork	3.7km	8
3	Cork College of Further Education	3.7km	6

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4.5.13.4 Health Services

There are six registered General Practitioners in the Study Area, along with five pharmacies, three dentists and two hospitals. In addition, a Primary Care Centre has recently been permitted on a site to the east of the development site.

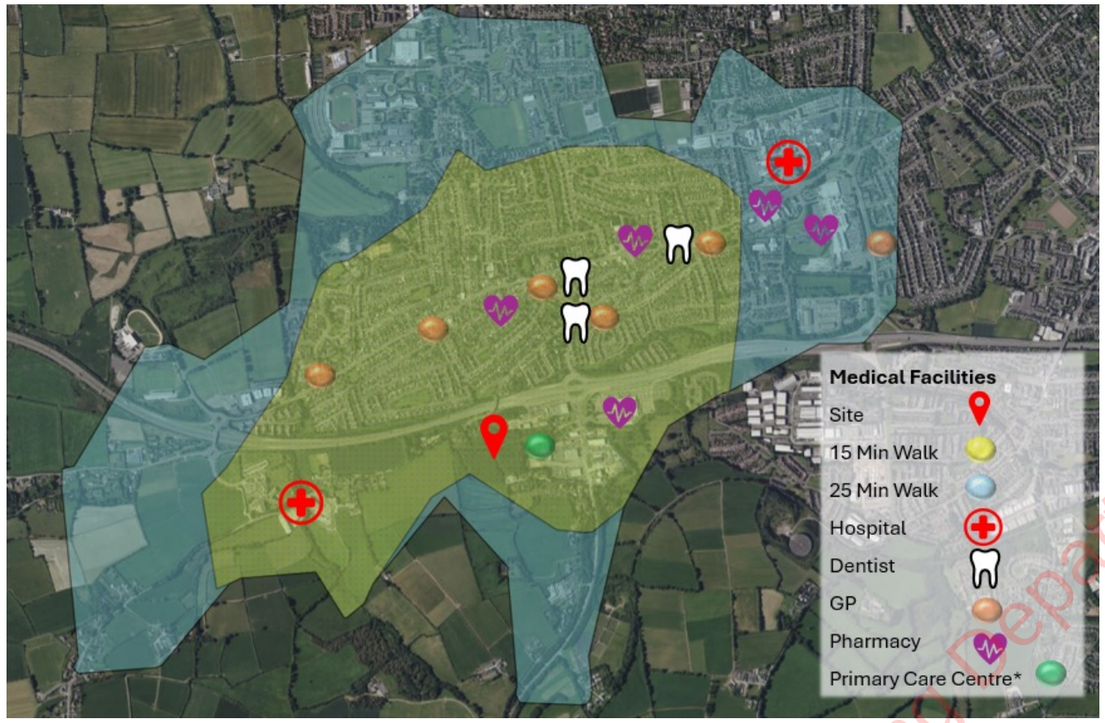


Figure 4.13 Healthcare Facilities in Study Area

Table 4.11 Medical Facilities in Study Area

No.	Hospital
1	Cork University Hospital
2	Marymount University Hospital and Hospice
No.	**Dentist**
1	Gentle Dental
2	Bishopstown Dental Clinic
3	Cork Endodontic Clinic
No.	**General Practice**
1	Curraheen Clinic
2	Dunphy-Healy Snowie Medical Centre
3	Rahona House Medical Practice
4	Cityplus GP
5	Doctor.ie Walk in Clinic
6	Wilton Medical Centre
No.	**Pharmacy**
1	O'Connor's Pharmacy Bishopstown Court
2	O'Connor's Pharmacy
3	Firgrove Pharmacy
4	O'Sullivan's Pharmacy
5	Boots Pharmacy
No.	**Primary Care Centre***
1	Primary Care Centre permitted under Ref No. 24/43027 (not yet constructed)

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4.5.13.5 Community and Amenity Services

There are a number of sporting and recreational facilities within the Study Area that will be available for future residents. GAA Clubs and Soccer clubs are located within the area, along with athletics tracks and gyms, providing a range of different fitness and sporting activities in the area.

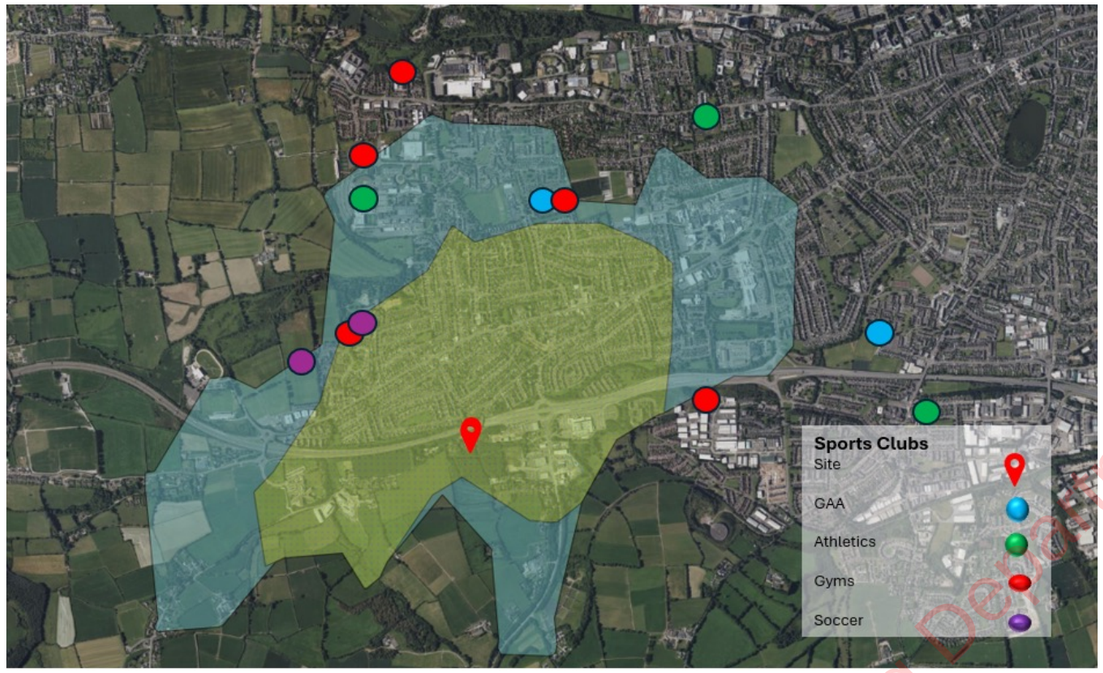


Figure 4.14 Sports and Recreational Facilities in Study Area

Table 4.12 Sports and Recreational Facilities in Study Area

No.	Facility
	Gyms/Leisure Centres
1	LeisureWorld Bishopstown
2	Maxlife Gym
3	Nebula Coaching
4	Outdoor Calisthenics Gym
5	EM Fitness and Nutrition
	Soccer Clubs
1	Kilreen Celtic F.C
2	UCC Soccer Club
3	Glasheen AFC
	GAA Clubs
1	Bishopstown GAA Club
2	Saint Finbarr's GAA Club
	Athletics Clubs
1	Togher Athletics Club
2	Leevale Athletics Club
3	MTU Athletics



Figure 4.15 Youth and Community Facilities in Study Area

In addition to sporting and fitness facilities nearby, the Study Area includes child and youth facilities such as playgrounds and community centres. Open spaces and recreational facilities will also be provided within the development site to ensure that young people have active spaces to interact.

Table 4.13 Youth and Community Facilities

	Community Centre
1	SMA Wilton Parish Centre
2	Togher Community Centre
	Playground
1	Bishopstown Playground
2	Clashduv Playground
	Community Garden
1	Bishopstown Community Garden
2	Children's Play Centre

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4.5.13.6 Retail and Convenience

There are a number of supermarkets, petrol stations and convenience stores located in close proximity to the site which offer a broad range and variety of products and services. These facilities will serve future residents of the development. Please refer to Figure 4.16 and Table 4.14 for further details.

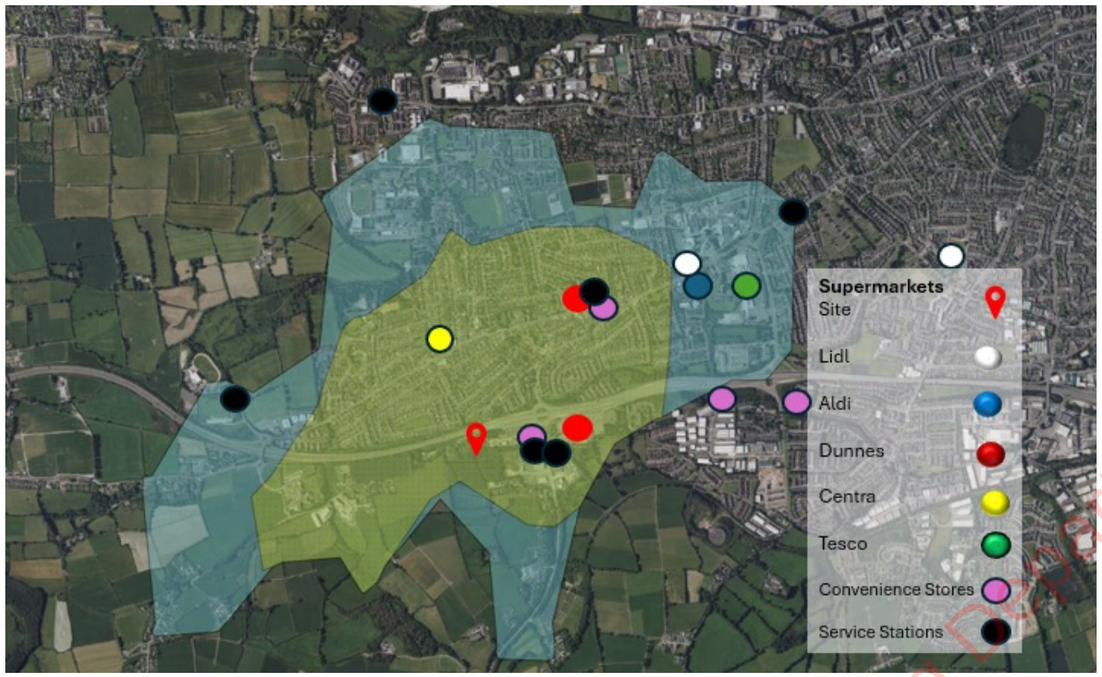


Figure 4.16 Supermarkets, Convenience Stores and Service Stations

Table 4.14 Supermarkets, Convenience Stores and Service Stations

No.	Supermarkets
1	Dunnes Stores – Bishopstown Court
2	Dunnes Stores – Bishopstown Shopping Centre
3	Lidl
4	Aldi
5	Tesco
6	Centra
7	Super Choice
8	Costcutter
9	Spar

No.	Service Stations
1	O'Donoghues Service Station
2	Circle K Bishopstown
3	O'Briens Bandon Road Junction
4	Firgrove Service Station
5	Maxol Service Station Wilton
6	Texaco Model Farm Road

4.6 The 'Do Nothing' Scenario

4.6.1 Actual Do Nothing

If the development was not to proceed there would be no immediate impact on the existing population, economic activity, or community services and facilities in the area However, if the development does not occur there will be a shortfall in housing supply in this area of the southwest suburbs of the City which may negatively impact the ability of Cork City to supply homes to meet the population projections in the coming years.

The site is zoned for residential development and the provision of housing on the subject site will support the core strategy and objectives of the Cork City Development Plan 2022. If the development does not occur the zoning and objectives of the Development Plan will not be realised in the short term.

In terms of Population and Human Health, a 'do nothing' scenario (i.e. not developing the proposed development site) would represent a lost opportunity to develop these lands for residential use on a zoned site. As such, the proposed development site would remain underutilised and it would not contribute to increasing the provision of housing in this area.

The impacts on land use are therefore envisaged to be negative to neutral for the 'do-nothing' scenario.

4.7 Difficulties Encountered

There were no difficulties encountered in preparing this chapter.

4.8 Consultation

Consultations with both the local authority and statutory bodies were also used to ensure that environmental issues, including socio-economic, recreational and amenity issues relating to the proposed development were addressed. Further information on the consultation process and responses received is provided in Appendix 1.1

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4.9 Impact Assessment

This section describes the environmental impacts that are likely to arise during the construction and operation of the proposed development. Section 4.10 sets out the mitigation measures required to alleviate identified impacts.

Potential Impacts are considered under the following headings in line with the Guidelines set out in section 4.10:

- Population
- Employment and Economics
- Health
- Residential Amenity
- Local Amenity Impacts

Specific impacts with respect to matters such as air quality, noise, traffic, visual impact etc. are dealt with in the respective assessments in this EIAR Construction Phase

The potential impacts of the proposal during the construction phase of the development are outlined below.

4.9.1 Construction Phase

The potential impacts of the proposal during the construction phase of the development are outlined below. The construction phase is expected to last approximately 24 months, as per the Construction Management Plan (CEMP) submitted with the application, under separate cover, by OSL Consulting Engineers

4.9.1.1 Population

The construction phase is not likely to result in any changes to the settlement patterns as described in Section 4.5.7.

The potential impacts arising during the construction phase relate to short term impacts to quality of life, including visual impact/amenity, noise, air quality, and transport. Where relevant, these impacts have been considered in the relevant chapters of the EIAR and will be minimised or mitigated where appropriate. It is unlikely that these impacts will be of a scale to either encourage people to move from the area or discourage people from moving to the area.

The construction phase may result in short term negative impacts on the local population.

4.9.1.2 Employment & Economics

The construction phase is anticipated to result in a temporary boost to the local economy as workers employed at the site can be expected to make use of local retail facilities and other services. If the application is successful, construction works will continue until the development is completed. Up to 180 workers will be employed on site during the construction phase, and there will be positive economic externalities to industries that are complimentary to the construction sector.

It is anticipated that the construction phase of the project will result in likely positive short term moderate impacts locally and within the wider area.

4.9.1.3 Health

As with any construction site, there will be potential risk to health and safety in terms of injury or death of construction personnel on-site due to the usage of large, mobile machinery as well as heavy equipment and materials.

Human health may be impacted on in a variety of ways and by several environmental receptors including water, biodiversity, climate, flooding, air, and major accidents, etc. Exposure to contaminants or pollutants can have serious implications for human health. Potential impacts on population and human health include inadequate water and wastewater infrastructure, contamination of soils, excessive noise, flooding due to non-control of surface water, poor air quality in areas where there are large volumes of traffic, and the health impacts associated with the storage of hazardous materials during the construction stage. These issues are addressed within the relevant discipline of the EIAR.

4.9.1.4 Residential Amenity

The anticipated likely significant impacts in the absence of mitigation on residential amenities relate to disruption due to increased construction traffic movements on the local road network, noise, dust and visual impact arising from plants (e.g. cranes) necessary to deliver the development.

In the absence of mitigation, the construction phase may result in short term negative impacts on the local population.

4.9.1.5 Local Amenity Impacts

The construction phase is not anticipated to impact on the local amenity of the area. The development site is not located in direct proximity to local amenity facilities in Bishopstown, such as parks, playgrounds or clubs. Therefore, the construction stage of the project is unlikely to result in any negative impact to local amenity.

Specific potential for impacts on residential amenities during the construction phase is dealt within this EIAR under the more specific chapters, such as Landscape & Visual, Air Quality, Built Services & Waste, Traffic & Transportation, Noise & Vibration and Risk Management chapters.

4.9.2 Operational Phase

4.9.2.1 Population

Based on the national household size of 2.74 persons, the proposed development of 246 no. units can be expected to provide a population of 674 no. persons. The 2022 census shows that the study area has 8.2% primary school aged children and 5.9% post primary school aged children. Based on this age profile, it is expected that the proposed development will lead to 55 no. primary school aged children and 40 no. post primary aged children over the development's lifetime. Similarly, based on the national household size, the proposed development (excluding all one-bed units) is likely to result in 26 no. children aged 0-4. The remainder of the 674 no. persons to be generated by the proposed development would all be over the age of 18 years.

The proposed development includes the provision of a childcare facility which is capable of accommodating 140 childcare places. Based on the childcare yield of the development, this childcare facility will sufficiently meet the demand created by the proposed development and the adjoining Waterfall Heights development. The location of the creche within the development is considered likely to result in significant, positive, long-term, impacts on population and settlement patterns in the area. Please refer to the Childcare Demand Report (CDR) for further details.

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4.9.2.2 Employment & Economy

There will be an economic benefit to local businesses during the operational phase. The proposed development includes for the provision of a creche which will lead to employment opportunities, boosting the community and local economy. Moreover, residents will use local facilities and services, and it is anticipated that the additional population will result in increased business for the wider area, and will have a positive, slight, long-term impact on the services including dentist clinics, pharmacies, banks, and various retail outlets in the Study Area.

4.9.2.3 Health

The proposed development will not result in any significant negative impacts to the health and wellbeing of the existing population. In particular, the design of the scheme ensures that future residents of the local environment will benefit from the development, in the form of open spaces and amenity areas.

The potential impacts on cycling and pedestrians will be positive, given the additional infrastructure provided. A lack of adequate recreation or amenity facilities has the potential to negatively impact human mental and / or physical health. The proposed layout provides for excellent public amenity and recreational facilities.

The provision of these amenity facilities within the proposed development will be of benefit to future residents and existing residents in the local environs. The operational phase of the proposed development, in terms of recreation and amenity facilities will, therefore, have a permanent significant positive impact on Human Health.

4.9.2.4 Residential Amenity

During the operational phase, the high-quality living environment of the proposed scheme will result in positive impacts on amenity for future residents. Achieving a high-quality living environment through an integrated and balanced design approach will have a locally significant, positive and permanent effect on residential amenity.

Future residents will enjoy a combination of private and public amenity spaces, which allow for privacy and interaction and inclusion, helping to foster a sense of community within the neighbourhood. Open spaces will be overlooked ensuring sufficient passive surveillance. This is determined to have a positive impact on residential amenity.

The proposed development at operational stage will result in traffic movements that are naturally associated with residential neighbourhoods.

4.9.2.5 Local Amenity Impacts

The proposed development provides high quality public open spaces. The public open space areas are conveniently located in different character areas of the development to ensure that all residents find these spaces accessible. There are a number of meadow and lawn areas with natural play features around the site, providing amenities for all needs and backgrounds.

The Social Infrastructure Audit, submitted with the application, demonstrates that there is a good variety of infrastructure within the catchment area. The proposed development site incorporates dedicated play areas within the public open space areas, as detailed in the Landscape Plan provided under separate cover. The proposed development also includes a childcare facility. The impact is deemed to have a locally positive, slight, and permanent impact.

As outlined previously, there are a number of healthcare associated facilities within the Study Area, including GP services, pharmacies, dentists and a recently permitted Primary Care Centre. These existing facilities and services may be utilised by future residents and continue to support the local economy.

As discussed in further detail above, the School Demand Assessment**,** submitted with the application, demonstrates that there are a number of both primary and post-primary schools within a 2km radius of the site. Moreover, although not featured within the scope of this assessment, there are additional schools located outside the 2km buffer, which offer additional alternatives for school age children.

The School Demand Report notes that enrolment projection figures provided by the Department of Education show that nationally both primary and post-primary enrolments are set to reduce considerably. Based on these projections primary level enrolment figures have reached their peak and are currently decreasing. Similarly, at post primary enrolment levels have reached their peak this year (2024/25) and are projected to start decreasing from next year.

It is projected that primary school enrolments will not begin to increase again until after 2036, and that post primary school enrolments will not begin to increase again until after 2042.

The proposed development is therefore expected to provide additional primary and post primary school aged children within the catchment area, at a time when enrolment figures are likely to be at their lowest.

Accordingly, the impact is deemed **locally neutral** with a significance that, at worst, would have a **moderate effect**.

In relation to the Childcare Demand Report submitted with the application, the proposed development also proposes the construction of a 140-place creche, which is more than capable of accommodating the number of places to be generated by the development and the adjoining Waterfall Heights development. The proposed development will therefore have a **slight, positive,** and **long-term** effect on the demand for pre-school places.

4.9.3 Cumulative Impacts

Cumulative impacts can result from individually insignificant but collectively significant actions taking place over a period or concentrated in a location. Cumulative impacts can occur where a proposed development results in impacts that, when considered in combination with impacts of other proposed or permitted plans and projects may result in a cumulative impact.

As noted above there is potential for the construction phase of the proposed development to overlap with the construction of recently permitted developments in the area (as listed in Chapter 1 of this EIAR) which would increase the potential impacts on human health and population. During the operational phase, the cumulative impact of these applications is expected to be slight, long-term impact and positive by providing additional homes, childcare facilities, community spaces, and public open spaces for the local population

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4.10 Mitigation Measures

4.10.1 Incorporated Design Mitigation

The proposed development complies with the Building Regulations which provide for the safety and welfare of people in and about buildings. The Building Regulations cover matters such as structure, fire safety, sound, ventilation, conservation of fuel and energy, and access, all of which safeguard users of the buildings and the health of occupants.

The proposed design provides for the segregation of pedestrians and bicycle traffic from motorised traffic. The design also incorporates the principles of universal design and the requirements of Part M of the Building Regulations so that the development will be readily accessible to all, regardless of age, ability or disability.

An assessment of the potential impacts of the construction and operation of the proposed scheme in relation to climate forms part of Chapter 14 Climate of this EIAR.

The integration of energy efficient measures into the design will provide for healthier living standards for future occupants, less dependence on fossil fuels and associated improved air quality. The availability of on the doorstep public open space, amenity spaces, and a highly accessible layout across the scheme will encourage sustainable modes of outdoor access for a wide age group.

4.10.2 Construction Phase Mitigation

An Outline Construction and Environmental Management Plan (OCEMP), Resource Waste Management Plan (RWMP) and Operational Waste Management Plan (OWMP) for the proposed development are included in the planning application documentation. The OCEMP, RWMP & OWMP will be further updated by the contractor, agreed with Cork City Council prior to commencement, and implemented by the selected contractor after any consent is received.

All construction personnel will be required to understand and implement the requirements of the OCEMP and RWMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.

The OCEMP provides for a construction phase management structure to ensure that environmental protection and mitigation measures are put in place. The OCEMP requires that these measures will be checked, maintained to ensure adequate environmental protection. The OCEMP also requires that records will be kept and reviewed as required to by the project team and that the records will be available on site for review by the planning authority.

All construction personnel will attend induction and training classes as required to ensure that the OCEMP is effectively implemented. The OCEMP will comply with all appropriate legal and best practice guidance for construction sites.

A full summary of construction phase mitigation measures are presented in Chapter 18 of this EIAR.

4.10.3 Operational Phase Mitigation

The proposed development is of a high quality design that incorporates generously sized units with integrated energy efficiency measures and an abundance of open space. The impact assessment section did not identify likely significant negative environmental impacts on population and human health arising from the operational phase of the proposed development. Accordingly, mitigation measures are not proposed.

4.11 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

The land will have an urban character for residential rather than a greenfield site. The residual effect of the proposed development for population and human health is determined to be significantly positive having regard to the delivery of much needed new homes in a location that has the carrying capacity in terms of both services and amenities to support the population generated by the scheme. The proposed mitigation measures will avoid, prevent, reduce impacts on the human environment during the construction and operational phases of the proposed development, where no significant adverse residual impacts have been identified.

The proposed development, in combination with the recently permitted development in the study area will have a cumulative positive impact on the area.

4.12 Interactions

Interactions are considered in Chapter 17 of this EIAR.

4.12.1 Material Assets: Traffic and Transport

There is potential risk from traffic related incidents which may arise, including an increase in pollutants which may affect air quality. In the current assessment, traffic derived pollutants which may affect air quality and thus population and human health have not been deemed as significant.

4.12.2 Land and Soils

There is a potential risk of dust generated from excavation and stockpiling of soil during the construction phase of the Proposed Development posing a human health risk in the absence of standard avoidance and mitigation measures which will be implemented to be protective of human health. Appropriate industry standards and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.

4.12.3 Material Assets: Waste

The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers.

4.12.4 Water and Hydrology

Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water control measures will be implemented as part of the Proposed Development.

Appropriate industry standard and health and safety legislative requirements will be implemented during the demolition and construction phase of the Proposed Development that will be protective of site workers.

The Proposed Development will increase the amount of people in proximity to flood-prone areas. This increased population density could heighten the potential for flood-related health impacts, particularly during construction. Residual risk will be mitigated by monitoring weather forecasts to optimize construction planning.

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4.12.5 Noise and Vibration

The Noise and Vibration chapter has been prepared in consideration of and in conjunction with the relevant elements of this chapter. For example, noise and vibration impacts associated with the Proposed Development have been fully considered within this Chapter of the EIA Report. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the proposed development.

4.12.6 Air Quality

Interactions between air quality and population and human health have been considered as the proposed development has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. There is also potential for impact on human health from a deterioration in air quality associated with emissions from vehicles.

However, the mitigation measures included in the proposed development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as having an overall insignificant impact, therefore air quality impacts from the proposed development are not expected to have a significant impact on population and human health.

The potential significant effects on population and human health arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative effects will occur.

4.12.7 Climate

Interactions between climate and population and human health have been considered as the proposed development has the potential to cause health issues as a result of impacts on climate.

Energy efficient design within the proposed development may give rise to reduced electricity consumption by future residents, potentially decreasing dependence on fossil fuels for energy generation, resulting in significant CO2 savings.

The potential significant effects on population and human health arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required.

4.12.8 Landscape and Visual

Construction processes and plant such as cranes used during the construction phase may give rise to visual impacts. Appropriate mitigation measures are outlined in the Landscape and Visual Impact chapter, as deemed necessary.

During the operational phase, the landscape plan will impact the quality of the private, communal and public open spaces, which could impact people's health and well-being.

4.13 Risk of Major Accidents or Disasters

The potential of major risks and disasters as a result of the proposed development has been assessed and the findings are presented in Chapter 16 of this EIAR.

There are no risks of major accidents and disasters which have been identified. The project comprises a residential use development on a greenfield site. All possible risks relating to existing soil contamination, potential flooding and construction activities have been considered and mitigation measures proposed where appropriate.

4.14 Worst Case Scenario

In the event that all mitigation measures fail to hinder potential negative impacts, the possibility of an increase of traffic within the surrounding roads and junctions of the site can occur. Furthermore, without these mitigation measures in place, noise caused by the construction of the proposed scheme may increase and can cause a disturbance to any residential dwellings in close proximity to the site. Moreover, when mitigation measures are not considered, there is the possibility of the impact on dust that can be carried throughout the site. Dust can expand beyond the site and create adverse effects on the neighbouring environment, including the neighbouring residential dwellings. However, it is imperative that mitigation measures are implemented to ensure that the worst-case scenario does not occur. When considering the mitigation measures that will be in place, the event of a worst-case scenario is deemed to be unlikely.

4.15 Monitoring

Measures to avoid negative impacts on Population and Human Health are largely integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development.

No specific monitoring is proposed in relation to this section. Monitoring of standard construction mitigation measures as outlined in this EIAR will be undertaken by the appointed contractor.

4.16 Conclusion

There are no significant adverse impacts with respect to socio-economic factors the population, or the amenity value potential of the area. Issues which may cause risks and hazards during the construction and operational phase of the development are given due consideration. All necessary mitigation measures will be put in place to ensure the health and safety of all site personnel and neighbouring properties. All other environmental aspects relating to the human environment which could have an adverse impact on the local population such as soils, geology & hydrology, water and ecology have been addressed in the relevant chapters of this EIAR.

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4.17 References and Sources

- Revised National Planning Framework, Ireland 2040
- Southern Regional Spatial and Economic Strategy 2019-2031;
- Cork County Development Plan 2022-2028;
- Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities) (Department of Housing, Local Government and Heritage, 2025);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Social Infrastructure Audit, MHP 2025;
- School Demand Assessment Report, MHP 2025;
- Childcare Demand Report, MHP 2025;
- Construction Environmental Management Plan (OSL 2025)
- Central Statistics Office (CSO) website www.cso.ie;
- Department of Education (DE) website https://www.gov.ie/en/organisation/department-of-education/;
- Pobal website https://maps.pobal.ie/; and
- Health & Safety Authority https://hsa.ie/eng/ .

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CHAPTER FIVE

LANDSCAPE & VISUAL

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McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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CHAPTER FIVE

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CHAPTER 5 | Landscape & Visual

5.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on landscape and visual impact. Other effects of lower significance have been included in this assessment to better inform the decision-making process.

This chapter should be read in conjunction with the architectural and landscape architectural plans and verified photomontages produced by external consultants as well as the Biodiversity and Cultural Heritage chapters of this report for references to and descriptions of relevant designations.

5.2 Expertise & Qualifications

JBA Consulting Engineers and Scientists Ltd has been commissioned to prepare a Landscape and Visual Impact Assessment (LVIA) for a proposed Large Residential Development at Ardrostig, Bishopstown, Cork. This chapter was prepared by Lukas Kazlauskas (Assistant Landscape Architect) and reviewed by Christos Papachristou (Principal Landscape Architect).

Lukas holds a bachelor's degree in landscape architecture and a master's degree in urban planning & design with University College Dublin. He has assisted in drafting LVIA reports and processing GIS mapping data for a number of infrastructure developments in Ireland. Christos holds an MA in Landscape Architecture and an MSc in Agricultural Engineering and Biotechnology. He is a Chartered Member of the Landscape Institute (CMLI) in the UK and Corporate Member of the Irish Landscape Institute (MILI). Christos has carried out multiple LVIAs and been involved in the preparation of LVIAs for EIARs as well as standalone in Ireland and the UK.

The team has carried out Landscape and Visual Impact Assessments and been involved in the preparation of EIARs for the following projects:

- Barrow Canal, for proposed improvement works within Co. Carlow, Co. Laois and Co. Kildare
- Brownsbarn Citywest LRD, SDCC
- BusConnects Galway, Co. Galway
- Dunboyne LRD Phase 1 & Phase 2, Co. Meath
- Mallow Castlelands Large Residential Development, Co. Cork
- N3 Virginia Bypass, Co. Cavan
- Residential development in Raitneachan, Co. Wicklow
- Residential development in Carrigaline, Co. Cork

5.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 Project Description 'Development Description' of this EIAR.

The proposed site will be accessed via Waterfall Heights Road. A possible future pedestrian/cycle connection is proposed along the north-eastern extents of the site and would connect to the N71, opposite of Dunnes Stores.

The existing hedgerow cutting across the site will be retained and enhanced.

5.3.1 Aspects Relevant to this Assessment

This assessment will consider elements of other disciplines that contribute to the landscape character of the areas surrounding the site. These relate heritage sites such as protected structures, as well as built and natural heritage (refer to Chapter 15 for Cultural Heritage & Archaeology assessments).

5.4 Methodology

5.4.1 Assessment Methodology

The Landscape and Visual Impact Assessment in the EIAR takes into consideration aerial photography, emerging design drawings, relevant publications, and reports, together with visits to the site and environs of the proposed development. The Assessment is carried out in accordance with:

- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Guidelines for Landscape and Visual Impact Assessment (GLVIA) as published by the Landscape Institute (UK) and the Institute of Environmental Management and Assessment (3rd Edition, 2013);
- Cork City Development Plan 2022-2028; and
- Cork County Development Plan 2022-2028.

Verified photomontages in accordance with the GLVIA guidance are included in Appendix 5.1 to facilitate the assessment of visual impacts. The locations for the photomontages have been agreed following liaison with the local planning authority.

The landscape and visual amenity chapter examines the potential effects of the proposed development on views of receptors within the Zone of Theoretical Visibility and Zone of Visual Influence. This includes residential properties and nearby open spaces, in terms of visual intrusion and visual obstruction. It also examines the impact on the landscape character from the permanent physical changes to the site brought about by the proposed development.

5.4.1.1 Landscape Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a proposed project, the following criteria are considered:

- Landscape character sensitivity;
- Magnitude of likely impacts; and
- Significance of landscape effects.

5.4.1.2 Sensitivity of the Landscape

The sensitivity of a landscape is the degree to which it can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape Character Areas (LCAs) are landscapes that share essential characteristics.

Landscape Sensitivity, often referred to as 'value', is classified using the following criteria which have been derived from a combination of industry guidelines from the Landscape Institute for Landscape and Visual Impact Assessment and professional judgement.

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- **Very high** - Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are very high value landscapes, protected at an international level e.g., World Heritage Site, where the principal management objectives are likely to be protection of the existing character;
- **High** - Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national level e.g., National Park, where the principal management objectives are likely to be protection of the existing character;
- **Medium** - Areas where the landscape character exhibits a medium capacity for change in the form of development. Examples of which are medium value landscapes, protected at a Local or Regional level e.g., Open space areas mentioned within a County Development Plan, where the principal management objectives are likely to be protection of the existing character;
- **Low** - Areas where the landscape character exhibits a high capacity for change and has very few or no designated landscapes or open space areas; and
- **Neutral** - Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the proposed development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

5.4.1.3 Magnitude of Likely Landscape Impacts

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed project. The magnitude considers whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the boundary of the proposed project that may have an effect on the landscape character of the area.

- **Very high** - Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality;
- **High** - Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality;
- **Medium** - Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality;
- **Low** - Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements;
- **Neutral** - Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable;
- **Neutral** - Changes that do not involve the loss of any landscape characteristics or elements and will not result in noticeable changes to the prevailing landscape character; and
- **Positive** - Changes that restore a degraded landscape or reinforce characteristic landscape elements.

5.4.1.4 Significance of Landscape Effects

The significance of the landscape impact will be the combination of the sensitivity of the landscape against the magnitude of the change. It is summarized in Table 5-1 below.

Table 5.1 Significance of Landscape and Visual effects based on Magnitude and Sensitivity

	SENSITIVITY				
MAGNITUDE	**Very high**	**High**	**Medium**	**Low**	**Negligible**
Very high	Profound	Very significant	Significant	Moderate	Slight
High	Very significant	Significant	Moderate	Slight	Slight
Medium	Significant	Moderate	Slight	Slight	Imperceptible
Low	Moderate	Slight	Slight	Imperceptible	Imperceptible
Negligible	Slight	Slight	Imperceptible	Imperceptible	Imperceptible
Neutral	Imperceptible	Imperceptible	Imperceptible	Imperceptible	Imperceptible
Positive	Positive	Positive	Positive	Positive	Imperceptible

5.4.1.5 Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric (or human-centric) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape.

Visual receptors most susceptible to changes in views and visual amenity are:

- **Very high** - Residents in properties within protected landscapes and travellers on a Scenic route where awareness of views is likely to be heightened;
- **High –** Residents in properties with predominantly open views from windows, garden or curtilage. People, whether residents or visitors, who are engaged in outdoor recreation including use of public rights of way, whose attention or interest is likely to be focused on the landscape and on particular views, and those on a scenic route where the view is not specifically in the direction of the proposed development;
- **Medium** - Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience, and communities where views contribute to the landscape setting enjoyed by residents in the area.
- **Low** - People engaged in outdoor sport or active recreation on a local scale, which does not involve or depend upon appreciation of views of the landscape; and people at their place of work whose attention may be focused on their work or activity, not their surroundings and where the setting is not important to the quality of working life, and people travelling in vehicles where their view is limited to a few minutes at any viewpoint; and
- **Neutral** - Changes affecting restricted viewpoints.

5.4.1.6 Magnitude of Visual Impacts

The magnitude of a visual effect is determined on the basis of several factors: the relative numbers of viewers, the distance from the viewpoint, the visual dominance of the proposed development within a view and its effect on visual amenity, as follows:

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- **Very high** - The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene;
- **High** - The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene;
- **Medium** - The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity;
- **Low** - The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene; and
- **Neutral** - The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.

Magnitude can also be described as:

- **Neutral** - Changes that are not discernible within the available vista and have no bearing the visual amenity of the scene; and
- **Positive** - Changes that enhance the available vista by reducing visual clutter or restoring degraded features.

5.4.1.7 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix as used earlier in respect of landscape effects, Table 5-1

5.4.1.8 Impact Classification Terminology

Table 5-2 overleaf presents the Impact Classification Terminology as published in the EPA guidance document (EPA, 2022). Standard definitions are provided in this glossary, which permit the evaluation and classification of the quality, significance, duration and type of impacts associated with a proposed development on the receiving environment.

Each impact is described in terms of its quality, significance, extent, duration & frequency and type, where possible.

Table 5.2 Impact Classification Terminology taken from EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

IMPACT CHARACTERISTICS	TERM	DESCRIPTION
Quality of Effects	**Positive**	A change that improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation within the margin of forecasting error.
	Negative/ Adverse	A change that reduces the quality of the environment.
Significance of Effects	**Imperceptible**	An effect capable of measurement, but without significant consequences.
	Not significant	An effect which causes noticeable changes in the character of the environment, but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.
Extent and Context of Effects	**Extent**	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions.
Probability of Effects	**Likely**	The effects that can reasonably be expected to occur because of the planned project, if all mitigation measures are properly implemented.
	Unlikely	The effects that can reasonably be expected not to occur because of the planned project, if all mitigation measures are properly implemented.
Duration and Frequency of Effects	**Momentary**	Effects lasting from seconds to minutes.
	Brief	Effects lasting less than a day.
	Temporary	Effects lasting less than a year.
	Short-term	Effects lasting one to seven years.
	Medium-term	Effects lasting seven to fifteen years.
	Long-term	Effects lasting fifteen to sixty years.
	Permanent	Effects lasting over sixty years.
	Reversible	Effects that can be undone, for example through remediation or restoration
	Frequency	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

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IMPACT CHARACTERISTICS	TERM	DESCRIPTION
Types of Effects	**Indirect/ Secondary)**	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do-Nothing'	The environment as it would be in the future should the subject project not be carried out.
	`Worst case'	The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable	When the full consequences of a change in the environment cannot be described.
	Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.

5.4.1.9 Cumulative Impact Assessment

The cumulative effect of a set of developments is the combined effect of all the proposed developments taken together.

Cumulative effects on visual amenity consist of combined visibility and sequential effects.

Combined visibility occurs where the observer is able to see two or more developments from one viewpoint.

- Combined visibility may either be in combination (where several developments are within the observer's arc of vision at the same time) or in succession (where the observer has to turn to see the proposed developments).
- Sequential effects occur when the observer has to move to another viewpoint to see different developments. For example, this could be when travelling along roads or paths. The occurrence of sequential effects may range from frequently sequential (the features appear regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints) to occasionally sequential (long time lapses between appearances, because the observer is moving very slowly and / or there are large distances between the viewpoints).

Cumulative landscape effects affect the physical fabric or character of the landscape, or any special values attached to the landscape.

- Cumulative effects on the physical fabric of the landscape arise when two or more developments affect landscape components such as woodland, dykes or hedgerows. Although this may not significantly affect the landscape character, the cumulative effect on these components may be significant – for example, where the last remnants of former shelterbelts are completely removed by two or more developments.
- Cumulative effects on landscape character arise from two or more developments. Housing developments introduce new features into the landscape. In this way, they can so change the landscape character that they can create a different landscape character type. That change need not be negative; some derelict or industrialised landscapes may be enhanced as a result of such a change in landscape character. The cumulative effects on landscape character may include other changes, for example trends or pressures for change over long time periods, which should form part of any consideration of a particular project.

5.4.2 Relevant Legislation & Guidance

The landscape assessment undertaken is made with regard to the sensitivity of the landscape and its ability to undergo change. The methodology is based on national and local policy guidelines and best practice methodology as outlined in the references below:

- Guidelines on Landscape and Visual Assessment (2002); Irish Landscape Institute (ILI)
- Guidelines for Landscape and Visual Impact Assessment (GLVIA), third edition (2013), Landscape Institute (UK) as amended in August 2024 (LITGN-2024-01)
- Guidelines on Information to be Contained in Environmental Impact Assessment Reports (2022); Environmental Protection Agency (EPA)
- Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (EIAR) (2017); European Commission
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013); European Commission
- Guidelines on Landscape and Landscape Assessment (2000); Department of the Environment, Community and Local Government
- National Landscape Strategy 2015-2025; Department of the Environment, Community and Local Government
- National Biodiversity Action Plan (2023-2030)
- Cork City Development Plan 2022-2028; Cork City Council

In addition to the above documents, Ordnance Survey and National Monuments Service historical maps were used to help identify past land uses, landscape components and historic landscape evolution.

5.4.3 Site Surveys/Investigations

Two site visits were carried out in June and August 2025. The site visits involved the verification of nearby views from the initial desk-based study and observations of the site and wider landscape for the purposes of the impact assessment. Field notes were recorded in relation to topography, land use, significant landscape features and overall landscape character.

5.4.4 Consultation

Consultation with Cork City Council was carried out to agree on the locations of verified photomontages. These were selected to cover the views of mainly sensitive receptors within the close visual envelope of the proposed development where there was a higher probability of impacts of higher significance. Following the site visit and in consultation with Cork City Council the locations were updated to omit locations where there is no intervisibility and include of views mainly along the north of the site where clusters of residencies exist. The initial and amended locations for photomontages are shown in Appendix 5.1.

5.5 Difficulties Encountered

The site visits took place during daytime therefore no night-time view assessment has been included. Views from private locations within properties have not been included in the assessment. These are approximated to the best possible publicly accessible viewpoint as per the GLVIA.

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The site visits were carried out in summer when vegetation provides maximum screening of views. Autumn views have been considered in the assessment.

Photography for the verified photomontages has been carried out from locations where the dominant views are best represented with a focus on the average to worst case scenario. This is to conclude with more certainty on the level of significance of the visual impacts deriving from the proposed development. Where this was not possible due to visual obstructions and/ or unsafe site conditions, the next preferred location has been selected to adequately demonstrate the potential visual impacts.

5.6 Description of Existing Environment

5.6.1 Receiving Environment – Site Context

Ardrostig is located along the southwestern fringes of Cork City, approximately 6 km from the city centre. The site is adjacent to the Waterfall Road which forms the northern boundary. Beyond this road to the north is the N40. The N71 is also located approximately 245m east of the site.

The proposed development occupies a greenfield plot. The surrounding land use mainly consists of a mix of greenfield and agricultural land. Existing built structures are limited to linear groups of residential estates and scattered properties along local roads. Nearby suburban settlements include Ballincollig, approximately 3km to the northwest, Wilton 2.5km to the west and Bishopstown directly to the north.

The wider context comprises large suburban landscapes. These consist of residential estates to the north and east. To the west and south, the landscape transitions to a rural setting of agricultural lands, with individual one-off houses and farmyards throughout.

The topography of the surrounding landscape is undulating. The topography of the landscape slopes lower to the north measuring approximately up to 23m (AOD). The highest terrain is to the south, where there are series of hills measuring up to 38m (AOD) which constrains long ranging views.

5.6.2 Landscape Character

The study area is covered by the Cork County Development Plan and the Cork City Development Plan. According to the Cork County Development Plan 2022-2028 (CDP) and Draft Landscape Strategy 2007, the proposed development site is located within the landscape character type 1 – City Harbour and Estuary. The landscape comprises a mix of rural and intensely urban areas, combined with a large expansive harbour. In the context of the site, harbour areas are not present in the vicinity of the proposed development, instead there are rural areas around it. These are characterised by a prevalence of infrastructure. These structures include roads, bridges, electricity power lines and urban sprawl.

The land cover consists of regularly shaped medium to large fields with mature broadleaf hedgerows, primarily used for intensive dairying, agriculture, and tillage. Both the landscape value and sensitivity are 'Very high', and importance rated as being of 'National' level.

Further south of the site is landscape character type 6a – Broad Fertile Lowland Valleys. The landscape features a mosaic of regularly shaped fields typically of medium size bounded by mature broadleaf hedgerows and post and wire fencing. The landscape value and sensitivity is classed as high, with a 'county' level of importance.

In relation to the Cork City Development Plan 2022-2028, the site is located within the city suburbs region. It is an area designated for Compact Growth as specified within the Cork City Growth Strategy. The objective of this region is to help create 10-minute walking areas (800m) between neighbourhoods that provide a mix of homes, schools, shops, parks, jobs and community spaces. This will be implemented through walkable neighbourhoods, towns and communities with mix of uses, house types and tenure that foster a diverse, resilient, socially inclusive and responsive city. This includes support for public and active travel infrastructure projects and services and enhanced neighbourhood permeability. Strategic infrastructure and large-scale developments shall demonstrate how they contribute to a 15-minute city and enhance Cork City's liveability and accessibility.

There are no designated architectural conservation areas or protected structures within the proposed development site.

5.6.3 Receiving Environment – Site

The proposed development site consists of a vacant greenfield with open grasslands, enclosed and divided by mature hedgerows and trees. A single hedgerow also runs through the site, containing traces of stone walls.

The topography of the site is undulating, sloping down gently to the north. The highest point is located at the southern boundary approximately 38m AOD, and the lowest elevation is located on the northern boundary at circa 23 m AOD.

5.6.4 Landscape Context

The landscape surrounding the proposed development at Ardrostig is a mix of urban and rural type. To the south, the area comprises grasslands with varied field sizes, bordered by tall mature hedgerows. Unlike the generally rural setting, the landscape changes to more urban to the north and east, where residential estates and commercial facilities are located.

There are thirteen (13no.) national monuments located within 1km of the proposed development site. This includes ringforts, enclosures and fulacht fias. The feature located closest to the proposed development is an enclosure approximately 103 metres southwest from the site, which is sited within a private enclosed field.

5.6.5 Zone of Theoretical Visibility and Zone of Visual Influence

The Zone of Theoretical Visibility (ZTV) and Zone of Visual Influence (ZoVI) were produced to inform this assessment. The ZTV shows where the proposed development could be visible from locations in the surrounding landscape based on a bare earth scenario. That is where existing built environment and vegetation is not present. The ZTV will inform the extents of the study area for the assessment of visual impacts. The radius that is considered needs to be proportional to the height and extents of the proposed development. For developments of similar size to the proposed, an area covering 2km around the proposal is generally accepted as a proportionate approach.

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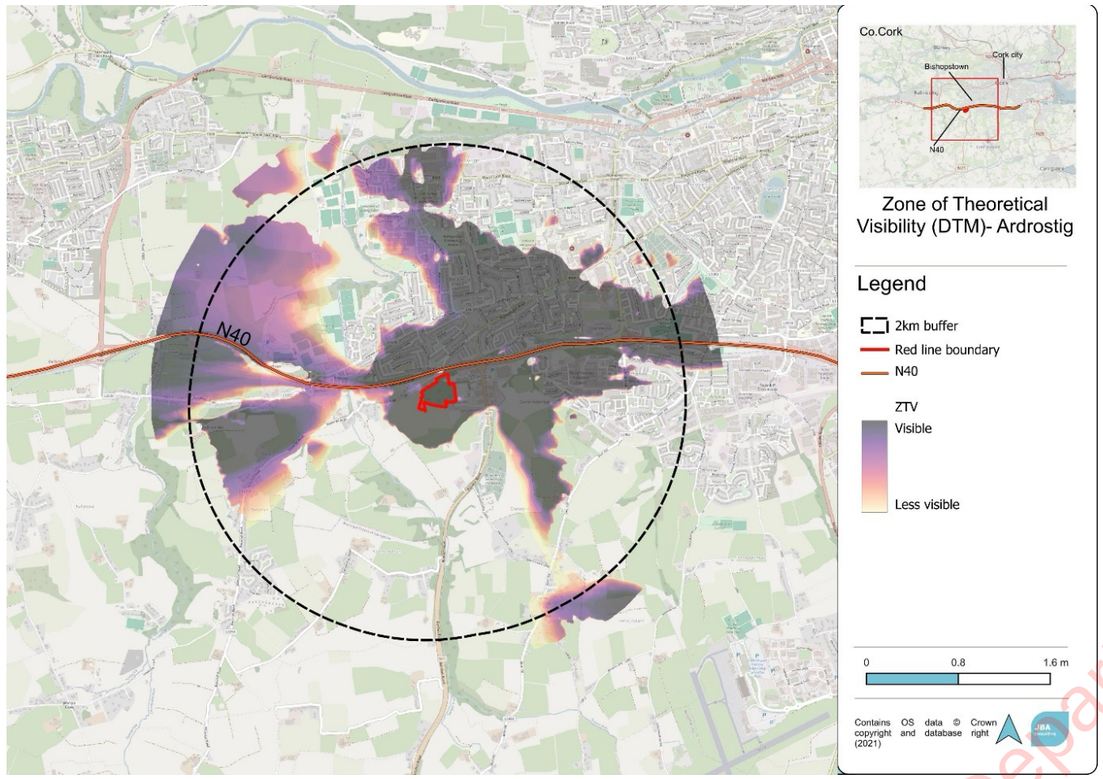


Figure 5.1 Zone of Theoretical Visibility (ZTV) using Digital Terrain Model (DTM)

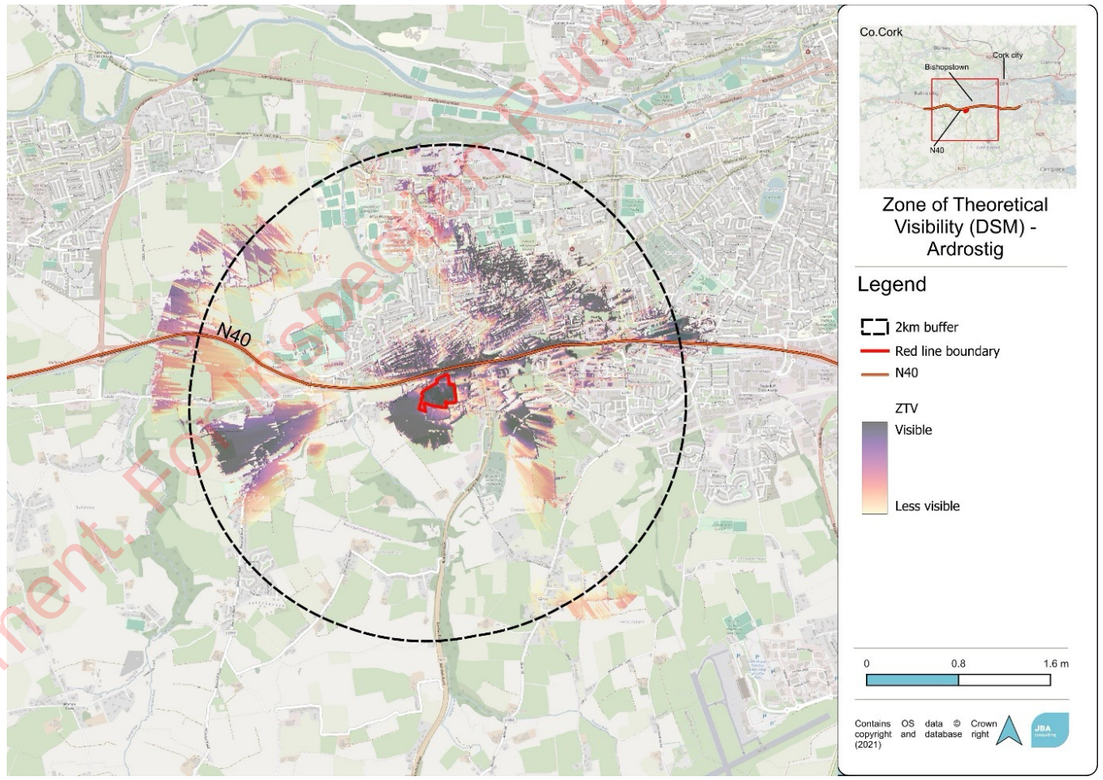


Figure 5.2 Zone of Visual Influence (ZoVI) – ZTV using Digital Surface Model (DSM)

The ZTV shown in Figure 5-1 above was used to identify where receptors that are more likely to be visually impacted by the proposed development are located.

The ZoVI is similar to a ZTV, but it is produced using a Digital Surface Model (DSM). This is different to the DTM as it includes data relating to the existing built environment and vegetation. The ZoVI is shown below in Figure 5-2 and highlights the areas where the proposed development is expected to be visible. Receptors identified within the ZoVI are expected to have more direct views to the proposed development.

5.6.6 Views & Prospects

There are no protected views and prospects, or scenic routes within 2km of the proposed development site.

One panoramic viewpoint lies 3km to the south. This is the Five County View viewpoint with long-range panoramic views reaching to the edges of Co. Kerry, Co. Limerick, Co. Tipperary and Co. Waterford. The viewpoint is located next to a local road with limited carparking and sitting space for visitors.

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5.7 Predicted Impacts

5.7.1.1 Predicted Impact Assessment

As described in the methodology, the impacts to the landscape and visual amenity will be assessed based on the sensitivity of the receptor and magnitude of change. This assessment as part of an EIAR will be focusing on potential significant and profoundly significant impacts and secondarily on impacts of lower significance.

Receptor groups were identified during the initial desktop investigation using aerial imagery and verified on site during the site visit. Receptors were grouped in terms of function, i.e., residential buildings, community buildings, etc., and location. See Figure 5-3 for the 'Visual Receptor Plan' which shows the identified receptor groups. These receptor groups are discussed below with an assessment of the effects on their visual amenity.

Twelve verified photomontages have been produced, as included in Appendix 5.1, showing the perceived view of a receptor overlooking towards the direction of the proposed development. This provides information of what the receptors could see if the site were to be implemented.

Impact Duration was considered permanent if a receptor had a distinct alteration to the horizon line or if views of a structure would continue to remain visible. During assessment, the landscape was also considered in the context of permanency. For example, retained mature trees were considered permanent, with management and evolution.

Type of Impact was considered positive only if the proposals contribute to the character of the locality and would not be detrimental to the rural setting. A negative *Type of Impact* might occur if for example, the proposal removed large sections of the hedgerows which was required to make space for roadway but would reduce the character of the landscape.

5.7.1.2 Landscape

The landscape Character Assessment (LCA) for the Cork City Development Plan 2022-2028 describes the landscape character the site is within as a "City Harbour and Estuary". Main pressures include a particular increase of population within suburbs associated with this landscape type, incentivizing on more housing developments. Other challenges include the decline in farm employment. This loss of labour results in the loss of traditional maintenance and management of key agricultural landscape features such as hedgerows and ditches. Key characteristics of the landscape features a mix of rural and intensely urban areas, combined with a large expansive harbour. The rural areas around this landscape type feature urban sprawl and prevalence of infrastructure such as roads.

Limited sections of existing hedgerows and trees are expected to be removed to open access roads into the proposed development site. The hedgerow that runs north to south in the centre of the proposed development site will be reduced in size but retained and enhanced with additional planting as part of the central open space.

According to the methodology and taking account to the proposed design, the overall impact to the landscape is expected to be *temporary*, *slight* to *moderate, negative* during construction phase to *permanent, slight, negative* during operational phase.

5.7.1.3 Visual

Receptor groups were identified during initial desktop surveys using aerial imagery and verified on site during site survey visits. Receptors were grouped in terms of function, i.e. Residential, commercial, community, town centre, etc. See Figure 5-3 for the receptors mapped around the proposed development site. These receptor groups are further described below in terms of the predicted effects of the proposed development site on their visual amenity.

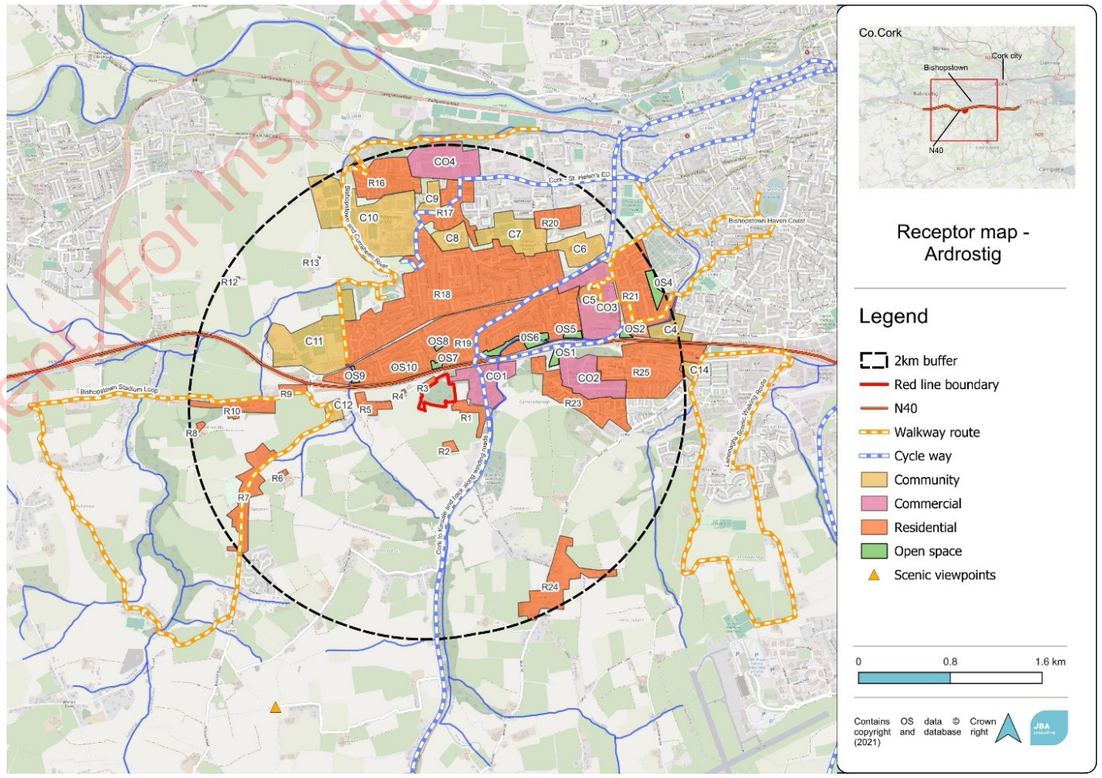


Figure 5.3 Receptor map

There are no designated monuments or protected structures within the proposed development site. The nearest monument structure is located southwest from the proposed site, approximately 103m (C019989). The proposed development is not expected to be visible from existing monuments and structures within the urban fabric, due to screening provided by the intervening topography, built environment and mature mixed vegetation.

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5.7.2 Receptor Descriptions

The visual effects for the receptors identified in Figure 5-3 are described in section 5.7.2.1 below for the operational phase. The assessment for construction phase is included where visual effects are expected to be higher than *temporary, slight, negative*, and is not included for effects that are likely to be short-term reversible or of lower significance.

5.7.2.1 Residential receptors

R1 (*21 no. properties located along residential roads east of N71 directly south of the site*) Distance from nearest site boundary = 0m

These properties have primary views facing various directions. In the northern section of the receptor group, 3 no. of two storey properties have primary views facing south, away from the proposed development. 10 no. properties have primary views facing north towards the site . Further south, 8 no. of two storey properties have primary views facing east, away from the proposed development. Sizes of front and rear gardens range from small to medium, partitioned by dense tall mixed treelines and hedgerows. A dense mature treeline runs across the northern edge of the receptor group on the boundary with the proposed development.

The surrounding landscape is a mix of suburban and rural. The suburban landscape is more prominent to the north, consisting of commercial and residential properties and the N40. To the south of the receptor group, the landscape is more rural. These landscapes consist of medium to large plots of fields with hedgerows with mainly deciduous trees acting as field boundaries.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude Views towards the proposed development are expected to be filtered by the existing retained treelines along the northern boundary of the receptor group. The tallest elements of the proposed development are expected to be visible above the treelines. Properties nearest to the site within the northern section of the receptor group will have indirect views via back gardens and/or rear windows. During construction, it is expected that the visual effect would be moderate due to moving plant, cranes and any removal of vegetation. Properties to the southern section of the receptor group are expected to have direct views towards the proposed development fully screened. Possible indirect views from side windows and/ or gardens are expected to be limited and filtered through existing vegetation and built environment. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low to negligible during operation and medium to low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore be ***temporary, moderate to slight, negative*** **during construction** and ***permanent, slight to imperceptible, negative*** **during operation**.

R2 (*Single, two-storey residential property along a private road branching off the N71 to the east. Located south from the site*) Distance from nearest site boundary = 300m south

This property if having main views facing to the east, away from the proposed development. Size of front and back garden are large. Vegetation cover surrounding the receptor is dense, consisting of mixed tall, mature trees. A deciduous hedgerow surrounds the front boundary of the property providing limited screening of views from upper floor.

The surrounding landscape is rural, consisting of large plots of fields designated for agricultural or pastoral use. These fields are bounded by dense mainly deciduous trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high.***

Magnitude Primary views are facing away from the site. Indirect views facing towards the proposed development to the north are available through side windows and back gardens. Views of the site are limited due to the dense mixed treelines surrounding the receptor. From this location, the proposed development is expected to be seen in the middle-distance background. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore be ***temporary, slight, negative*** during construction due to the removal of the existing vegetation and moving plant of the proposed development, and ***permanent, slight, negative*** **during operation**.

R3 (*A small group of one-storey residential properties located along the L-5037 (Waterfall Road). Immediately north from the site.)* Distance from nearest site boundary = 0m

Primary views of these properties are oriented to the northeast, away from the site. Size of front and back gardens are small. Vegetation cover surrounding each property is moderately dense, consisting of tall, mainly deciduous trees with dense hedge partitioning each property. A dense treeline also exists along the southeastern boundary of the receptor group.

The surrounding landscape is a mix of suburban and rural. To the north, the landscape is suburban, consisting of large, two-storey residential estates and small local commercial facilities. To the south of the of receptor group, the landscape is rural, consisting of large plots of fields designated for pastoral and agricultural use. These fields are bounded by deciduous tall trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high.***

Magnitude Primary views are facing away from the site to the northwest. Indirect views facing toward the proposed development are available through rear windows and back gardens. The introduction of new built form in close proximity to the receptor group is expected to result in a low visual effect. This is due to the preservation of treeline that bound the rear border of the receptor group, providing natural screening. During construction, the visual effect is expected to increase, due to moving plant and removal of existing vegetation within the site. This is expected to result in medium visual effect. This is temporary, however. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and medium during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore be ***temporary, moderate, negative*** during construction due to the removal of the existing vegetation and moving plant of the proposed development, and ***permanent, slight, negative*** **during operation**.

R4 (*A single, two-storey residential property located along the L-5037 (Waterfall Road). Located east from the site.)*
Distance from nearest site boundary = 128m

Primary views are oriented to the southeast, nearly towards the proposed development. Size of front and back garden is medium. Vegetation cover is dense, consisting tall, mature deciduous trees. The front of the property is relatively open, allowing for long-ranging views to the southeast.t. A low-lying wall encloses the front house, providing partial screening at ground level.

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The surrounding landscape is a mix of suburban and rural. To the north, the landscape is suburban, consisting of large, two-storey residential estates and small local commercial facilities. To the south of the of receptor group, the landscape is rural, consisting of large plots of fields designated for pastoral and agricultural use. These fields are bounded by deciduous tall trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude Primary views from the property are not directly viewing the site, but angled views are possible. The existing group of trees surrounding the receptor provides partial filter of long ranging views, reducing the visual effect of the proposed development. However, the front side of the property is open, allowing unobstructed partial views of the proposed development. The scale and massing of the proposed development is expected to be readily perceptible in the view. It is expected that the built form. During construction, to result in low visual effect due to moving plant and removal of vegetation but filtered by the existing treelines flanking the property. This is temporary, however. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore be ***temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R5 (*A medium-sized group of one to two-storey residential properties located along L-2230. Located west from site.)*
Distance from nearest site boundary = 264m

Primary views are varied. 10 no properties located along the L-2230 are oriented north-south, away from site. 5 no. properties are located along adjoining residential roads perpendicular to the L-2230, whose orientation is east-west, towards the site. Sizes of front and back gardens range from small to medium, bounded by low-lying hedges or walls partitioning some properties. Vegetation cover within each property is low. This vegetation cover consists of mainly deciduous trees, and a few shrubs.

The surrounding landscape is a mix of suburban and rural. To the north of the receptor group, the landscape is more suburban, consisting of large residential estates and commercial facilities. To the south of the receptor group, the landscape becomes more rural, consisting of medium to large sized plots of fields. These fields are bounded by tall mainly deciduous trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude Primary views are mainly oriented away from the site. Where views are available, they will be filtered or partially screened by existing treelines and hedgerows that bound the intervening agricultural and pastoral fields. For the limited number of properties with direct views toward the site, the proposed development will be softened by this existing vegetation and neighbouring properties in the receptor group. During construction, the introduction of moving plant and vegetation removal is expected to have negative visual effect. This is expected to result in low temporary visual effect. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R6 (*Two, two-storey residential properties located along a private road approximately 146m northwest of the L-2230. Located southwest from the site)* Distance from nearest site boundary = 1274m

Primary views vary: The eastern property is oriented to the northwest, away from the proposed development. The western property is oriented to the northeast, away from the proposed development. Sizes of front and back gardens are medium, bounded by mainly deciduous hedges. Vegetation cover within each property is low, with the most concentration of vegetation located along the boundary of the front and back garden.

The surrounding landscape is rural, consisting of medium to large sized plots of fields. These fields are designated for agricultural or pastoral use, bounded by tall mainly deciduous trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude Primary views from both properties are oriented away from the proposed development. Indirect views toward the site from side windows or rear gardens are expected to be limited to small, glimpsed views of upper built forms, due to the significant distance and presence of intervening vegetation such as hedgerows and treelines. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative*** during operation.

R7 (*A large linear group of one to two-storey residential properties located along the L-2230. Located southwest from the site.)* Distance from nearest site boundary = 1315m

All primary views face away from the site. The orientation of these properties in relation to the proposed development means that views are generally angled, indirect or screened by other properties. Vegetation cover is moderately dense, consisting of dense, mainly deciduous hedges partitioning each property. A particularly dense vegetation cover comprising scrubland is located within the northeastern section of the receptor group, providing natural screening of surrounding views.

The surrounding landscape is rural, consisting of medium to large sized plots of fields. These fields are designated for agricultural or pastoral use, bounded by tall mainly deciduous trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude No primary view within the receptor group is oriented toward the site. Indirect views through back gardens and side windows are expected to see glimpsed views of the proposed development, and at such distances would be subtle in the overall view. Available views are filtered by existing vegetation bounding each property. The distant intervening treelines and hedgerows bounding nearby agricultural and pastoral fields further provides screening. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

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R8 (*A pair of two-storey residential properties located along Ballinveitig road. Located west from the site.)* Distance from nearest site boundary = 1901m

Primary views are oriented to the east, towards the proposed site. Vegetation cover within each property is dense, consisting of mixed, tall mature trees surrounding each property with additional mixed shrubs and hedges in the front gardens. Dense vegetation lines both sides of the Ballinveitig road, providing natural screening and limiting views to the road. This vegetation consists mainly of tall, deciduous mature trees and hedgerows. A small linear patch of scrubland lies directly on the north side of the Ballinveitig road. This scrubland consists of dense, mainly deciduous trees and shrubs. An existing medium-sized agricultural facility is located within the southwestern portion of the receptor group, contributing additional screening.

The surrounding landscape is rural, consisting of medium to large sized plots of fields. These fields are designated for agricultural and pastoral use, bounded by tall mainly deciduous trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude Although the majority of primary views are oriented towards the proposed development, its visual presence is expected to be subtle due to the significant distance and the presence of multiple layers of natural screening. Intervening treelines and hedgerows bounding agricultural and pastoral fields contribute to this screening effect. Further mitigation is provided by vegetation along Ballinveitig Road and the nearby patch of scrubland.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains subtle throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent but still take up a small portion of the overall view. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R9 (7no. of one to two-storey residential properties located along the L-22221, adjoining the L-2222 to the south. Located west from the site.) Distance from nearest site boundary = 1059m

Primary views from these properties are generally oriented south, away from the proposed development. Sizes of front and back gardens range from small to medium. Vegetation cover within each property is moderately dense. This consists of mixed, tall treelines along with mixed dense shrubs and hedging partitioning each property. The easternmost section of the receptor group contains particularly dense evergreen trees, offering significant year-round screening. Additionally, a dense patch of deciduous trees is located in the southeastern section of the receptor group. This stretches along the L-2222 road to the Curraheen roundabout to the east.

The surrounding landscape is a mix of suburban and rural. To the north, the landscape is suburban, consisting of large, two-storey residential estates and community facilities such as sport pitches. To the south of the of receptor group, the landscape becomes rural, consisting of large plots of fields designated for pastoral and agricultural use. These fields are bounded by deciduous tall trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude The majority of primary views are oriented away from the proposed development. Indirect views to the southeast are possible from side windows and front gardens. At this distance, the proposed development is expected to appear subtle within the broader landscape. Multiple layers of intervening vegetation including treelines and hedgerows bounding agricultural and pastoral fields further mitigate visibility. Screening is reinforced by the vegetation surrounding each property, limiting even glimpsed views of the proposed development.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent but still take up a small portion of the overall view. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R10 *(25 no. one to two-storey residential properties located along the L-2222 and Ballinveitig road adjoining the L-2222 to the north. Located west from site.)* Distance from nearest site boundary = 1273m

Primary views are all facing away from the proposed development, oriented to the north - northwest. Sizes of front and back gardens are small. Vegetation cover varies across the receptor group, with the eastern section exhibiting the highest density. This vegetation consists of dense, mainly deciduous treelines that bound each property as well as lining the Ballinveitig road. Mixed shrubs and hedging also bound each property. In contrast, the western section has sparser vegetation, consisting of dense evergreen hedging and occasional deciduous trees. A dense-linear patch of scrubland is located along the Ballinveitig road, providing dense natural screening. This is mainly comprised of dense tall deciduous trees and dense undergrowth.

The surrounding landscape is rural, consisting of medium to large sized plots of fields. These fields are designated for agricultural and pastoral use, bounded by tall mainly deciduous trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude All primary views face away from the proposed development. Indirect views towards the proposed development to the east is possible from side windows and from elevated heights within two-storey properties. Due to the distance between the receptor and the proposed development, it is expected that it will appear subtle in the context of the wider landscape. This is due to the presence of intervening treelines and hedgerows that bound the distant agricultural and pastoral fields, forming layers of screening. This is further mitigated by the presence of natural screening surrounding each property, filtering indirect views. Properties within the western section of the receptor group are expected to be densely screened of the proposed development due to existing residential properties as well as the presence of the linear patch of dense scrubland.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent but still take up a small portion of the overall view. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

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R11 (*A single, two-storey farmhouse with an adjoining agricultural facility. The property is located along a private road, approx. 957m from the L-2216 to the north. Located northwest from site.*) Distance from nearest site boundary = 1869m

The primary view from the property is oriented south, facing away from the proposed development. Vegetation cover surrounding the property is moderately dense. This consists of tall, mature mainly deciduous trees and hedgerows, providing natural screening and filtering views of the surrounding landscape.

The surrounding landscape is rural, consisting of medium to large sized plots of fields. These fields are designated for agricultural and pastoral use, bounded by tall mainly deciduous trees and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude The primary view is oriented away from the proposed development. Indirect views towards the southeast may be available from side windows and upper floors. Due to the distance between the receptor and the proposed development, it is expected that it will appear subtle in the overall view. The prominence of the proposed development is further mitigated by intervening treelines and hedgerows that bound the distant agricultural and pastoral fields, forming layers of screening.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent but still take up a small portion of the overall view. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R12 (*A single, two-storey residential property located along L-92212, approximately 992m from the R-608 to the north. Located northwest from the site.*) Distance from nearest site boundary = 1505m

The property's primary view is oriented to the south, away from the proposed development. Vegetation cover surrounding the property is low. This consists of tall, mature mainly deciduous trees and hedgerows, providing natural screening and limiting views of the surrounding landscape. The eastern and southern boundaries have higher vegetation density, providing natural screening. Three, tall mature evergreen trees stand in front of the property, they are spaced intermittently, allowing for intermittent, clear-southern views of the distant landscape.

The surrounding landscape is rural, consisting of medium to large sized plots of fields. These fields are designated for agricultural and pastoral use, bounded by tall mainly deciduous trees and hedgerows. Further southeast however, the landscape becomes more suburban, consisting of densely built residential estates and commercial facilities.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude The primary view from the property is oriented away from the proposed development. However, angled views to the southeast towards the proposed development are possible. Given the receptor's distance from the site, any potential visibility of the proposed development is expected to be limited and subtle within the wider rural context. The prominence of the proposed development is further mitigated by intervening treelines and hedgerows that bound the distant agricultural and pastoral fields, forming layers of screening. The presence of evergreen trees offers partial year-round screening, though spacing allows intermittent glimpses. In addition, the presence of dense suburban built form further southeast contributes to screening and reduces the proposed development's visual prominence.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent but still take up a small portion of the overall view. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R13 (*A collection of two-storey residential estates located along residential roads adjoining the R-608, including Rossbrook, The Manor, Woodford, Wyndwood, and Melbourne Court. Small clusters of four-storey apartments are also present. Located north from site.*) Distance from nearest site boundary = 1614m

Primary views are varied, but are mainly oriented to the south, towards the proposed development. Sizes of front and back gardens are small. Vegetation cover within the receptor group is generally low. This consists of mainly deciduous treelines that line across R-608 and a limited number of shrubs. The highest density of vegetation is within Melbourne Court and The Manor estates, where moderately dense treelines bound each property.

The surrounding landscape is mainly suburban, consisting of densely built residential estates and commercial facilities. The landscape becomes more rural further north, consisting of medium to large sized plots of fields designated for agricultural and pastoral use. The fields are bound by dense deciduous treelines and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude The majority of primary views are oriented towards the proposed development. Due to the distance between the receptor and the proposed development, it is expected to appear subtle in the context of the wider suburban landscape. The prominence of the proposed development is further mitigated by the existing built environment further south of the receptor group. Elevated views from upper storeys within the four-storey apartment blocks may provide more open views towards the proposed development, but these are expected to be filtered and occupy only a minor portion of the overall view. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R14 (*A medium-sized collection of two-storey residential estates located mainly along the L-5109, and L-5286 with curved residential roads adjoining them. Located north from site.*) A large collection of Distance from nearest site boundary = 1505m

Properties in this receptor group are oriented in multiple directions and are therefore oriented in a manner that results in angled or indirect views towards the site. A smaller group of properties are oriented towards the proposed development to the south within the northeastern section of the receptor group. Sizes of front and back gardens are generally small. Vegetation cover within the receptor group is low, consisting of a small number of deciduous trees and shrubs.

The surrounding landscape is mainly suburban, consisting of densely built residential estates and commercial facilities.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

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Magnitude Given the considerable distance between this receptor group and the proposed development; the proposed development is expected to appear subtle within the overall view. The prominence of the proposed development is further mitigated by the presence of the built environment of the suburban landscape, providing dense screening against angled, indirect and direct views. Potential glimpsed views of the proposed development may be visible above the roofs or gaps of distant properties. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R15 (*A large collection of one to two-storey residential estates located mainly along the L-1016 towards R-849 to the east as well as residential roads and cul-de-sacs adjoining L-1016. Located northwest, north, northeast from site.)* Distance from nearest site boundary = 545m

The majority of primary views are oriented south towards the proposed development. Properties not directly facing the site are positioned such that they may experience angled or indirect views. Sizes of front and back gardens are small. Vegetation cover within the receptor group is moderately dense. Back garden boundaries are typically lined with medium-sized deciduous trees forming informal treelines, while evergreen hedging along front gardens provides consistent screening at ground level. The local topography is undulating, with this receptor group situated on relatively higher terrain, enhancing the potential for distant views to the south.

The surrounding landscape is mainly suburban, consisting of densely built residential estates and commercial facilities.

Sensitivity Receptors are residents at home. **Sensitivity is *high***.

Magnitude Although the receptor group is located relatively close to the proposed development, the presence of existing suburban built form such as R16 provides layers of visual screening. Views of the proposed development are expected to appear subtle in the context of the wider suburban setting. Indirect and angled views of the site may be available above rooftops or through breaks in vegetation, but these are expected to occupy only a small portion of the view. The vegetation along back gardens is expected to filter indirect views and angled views towards the site.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent, allowing narrow views of the site. This is expected to still take up a small portion of the overall view, however. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R16 *(A large collection of one to three-storey residential estates located mainly along the L-2222 to the west, the L-1016 within the middle of the receptor group and R-849 to the east. Cul-de-sacs and curved residential roads adjoin these routes.)* Distance from nearest site boundary = 93m

Primary views face multiple directions. However, the majority of properties are oriented south towards the proposed development. Properties not directly facing the site are positioned such that they may experience angled or indirect views. Sizes of front and back gardens are small. Vegetation cover within the receptor group is moderately dense, consisting of medium-sized deciduous trees mainly within back garden boundaries forming informal treelines. Front gardens within each property are often lined with evergreen hedging, providing natural screening of views from ground floors. Dense vegetation lines across the N40, which further restricts long-range views beyond the national road.

The surrounding landscape is mainly suburban, consisting of densely built residential estates and commercial facilities.

Sensitivity Receptors are residents at home. **Sensitivity is *high***.

Magnitude Properties further away from the site are expected to be visually screened by neighbouring properties. Indirect and angled views may be available above rooftops, particularly from upper storeys, but these are anticipated to take up only a small portion of the overall view. The vegetation along back gardens is expected to filter indirect views and angled views towards the site. The dense treeline along the N40 provides natural screening of potential views towards the proposed development. Properties located closest to the site are expected to be able to partially observe the site. This is due to the dense treeline lining the N40, limiting the visibility of the proposed development to small, glimpsed views of its upper sections.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent, allowing narrow views of the site. This is expected to still take up a small portion of the overall view, however. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

***R17 (A small collection of two-storey residential estates located along the L-50867 to the west, the L-5088 within the middle of the receptor group, L-50863 and L-99226 to the east. Located northeast from site.)* Distance from nearest site boundary = 1565m**

Primary views are varied but are mainly oriented east - west, away from the proposed development. A few remaining properties located along L-99226 are oriented south towards the proposed development. Sizes of front and back gardens are small. Vegetation cover within the receptor group is moderately dense, with medium-sized deciduous trees commonly found along the rear garden boundaries, forming informal treelines. Front gardens within each property are lined with evergreen hedging and with a small number of trees, offering natural screening of views at ground floor levels.

The surrounding landscape is mainly suburban, consisting of densely built residential estates and commercial facilities.

Sensitivity Receptors are residents at home. **Sensitivity is *high***.

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Magnitude Primary views are mainly oriented away from the proposed development. For properties that face towards the site, existing suburban built form provides substantial visual screening. Potential indirect or angled views may be available from upper floors, particularly above the rooftops of intervening properties. These views are expected to take a small portion of the overall view. The vegetation along back gardens is expected to filter indirect views and angled views towards the site.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change is still expected to remain unchanged however, due to the existing built environment. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R18 (A medium-sized collection of one to two storey residential estates located along the L-5254 and L-50727 adjoining R-849 to the north. Located east from the site.) Distance from nearest site boundary = 1565m

A large group of two-storey residential properties located along the L-5254 and L-50727 which branches off from the R-849 to the north. There are also three storey-apartments within the southern section of the receptor group located along Sandbrook road. Primary views are varied but are mainly facing southwest towards the proposed development. Despite the remaining properties are facing away from the site, contain indirect and angled views relative to the direction of the proposed development. Sizes of front and back gardens are small. Vegetation cover within the receptor group is low. Consisting of mainly evergreen hedging lining around the boundary of a few properties, with the majority utilising constructed walls.

The surrounding landscape is mainly suburban, consisting of densely built residential estates and commercial facilities

Sensitivity Receptors are residents at home. **Sensitivity is *high***.

Magnitude Primary views are mainly oriented towards the proposed development. Remaining properties that are oriented towards the proposed development are expected to observe glimpsed views. This is due to the current views being occupied by the existing built environment, consisting of similar residential estates. Potential indirect and angled views of the proposed development may be visible above the roofs or gaps between the built environment but are expected to take a small portion of the overall view. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R19 *(A medium sized group of one to two-storey residential estates including Eagle Valley, Sarsfield Heights and Garrane Darra which contains three-storey apartments. Properties are located along L-9197 adjoined with curved residential roads. Located east from the site.)* Distance from nearest site boundary = 687 – 1555m

Primary views are oriented in multiple directions. Views from properties in Garrane Darra face towards the proposed development to the west. However, further southeast along the L-9197 and adjoining roads, properties in Eagle Valley and Sarsfield Heights exhibit angled, indirect, or screened views due to adjacent built form. Vegetation cover density is moderately dense, consisting of mainly deciduous mature tall trees in open green areas and back gardens, forming informal treelines. Additionally, dense layers of treelines comprising tall, mature deciduous trees limit long ranging views toward the west, which stretches along the southern – southeastern boundary of the receptor group. The topography is undulating, with the highest point located to the southeasternmost section of Eagle Valley and the lowest to the northwest towards Garrane Darra.

The surrounding landscape is a transition between suburban and rural type. To the north - northeast of the receptor group, the landscape is suburban consisting of densely built residential estates and commercial facilities. To the south of the receptor group, the landscape becomes more rural. Consisting of medium to large-sized fields designated for agricultural and pastoral use. These fields are bounded by tall, deciduous treelines and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high***.

Magnitude Although Garrane Darra is the closest to the site, views are largely screened by dense vegetation and existing built form from intervening receptor groups such as Co6. Its lower elevation further reduces visibility. The layered treelines stretch along the southern – southeastern boundary of the receptor group, providing dense screening for properties within Eagle Valley. Properties further away from the site are expected to be screened by intervening neighbouring properties, filtering indirect or angled views of the site. At most, the tallest element of the proposed development may be visible above the treelines or gaps between intervening properties. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

R20 *(A medium linear group of one to two-storey residential properties located along L-2452 and private roads adjoining L-2452. Located southeast from the site)* Distance from nearest site boundary = 1500m – 1824m

Primary views are oriented east – west away from the site. Vegetation cover density is moderately dense, consisting of dense mainly evergreen hedging, partitioning each property. Tall mixed trees and shrubs enclose the front gardens of each property providing natural screening. A linear group of residential properties is located immediately east of the receptor group along the L-2452, providing constant screening of long distant views of surrounding environs. A single one-storey property with adjoining agricultural facilities is located separately from the linear group to the east, surrounded by dense treelines.

The surrounding landscape is rural type, comprising medium to large-sized fields designated for agricultural and pastoral use. These fields are bounded by tall, deciduous treelines and hedgerows.

Sensitivity Receptors are residents at home. **Sensitivity is *high***.

Magnitude All primary views face away from the site. Angled or indirect views are possible through side windows or elevated heights or rear gardens. Views towards the site is largely screened by intervening built properties northwest of the receptor group. Additionally, the vegetation bounding each property and the distant rural fields further mitigates potential views of the site. At most, the tallest element of the proposed development may be visible above the treelines or gaps between intervening properties. This is expected to intrude a small portion of the overall view and would appear subtle. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

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R21 *(A collection of two-storey residential estates including Westside Estate, Westbury Grove, Elm Vale and three-storey apartments in The Headlands. Located east from the site)* Distance from nearest site boundary = 1250m – 2185m

Primary views are oriented in multiple directions, oriented along curved roads. Vegetation cover density is moderately dense, comprising mainly deciduous trees lining residential roads and within back gardens forming informal treelines. A dense linear wooded area consisting of mainly deciduous trees along the south site of N40 provides natural screening.

The surrounding landscape is suburban, comprising large suburban residential estates such as R18 to the north and R19 to the southwest and commercial facilities such as CO2 to the west.

Sensitivity Receptors are residents at home. **Sensitivity is *high*.**

Magnitude Angled or indirect views are largely screened by intervening built properties surrounding the receptor group. Additionally, the dense wooded area along the west side of the N40 limits views of the site, coupled with informal treelines along the back gardens of the receptor group screening views from adjacent properties. At most, the tallest element of the proposed development may be visible above the treelines or gaps between intervening properties. This is expected to intrude a small portion of the overall view. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore **be *temporary, slight, negative* during construction** due to the removal of the existing vegetation within the site and moving plant and ***permanent, slight, negative* during operation**.

5.7.2.2 Community receptors

C1 (*Saint Finbarr's National Hurling and Football Club*. Located east from the site) Distance from nearest site boundary = 1825m

A group of sport pitches. The landscape directly surrounding this receptor is largely suburban, comprising of residential estates such as R18 and R21.

Sensitivity The receptors are visitors engaged in outdoor activities and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the site are expected to be fully screened by the existing nearby residential estates such as R18 and R21. If the proposed development is visible from this receptor, it will be glimpses from gaps in the existing dense built environment. The intervening distant suburban residential estates and treelines lining the N40 is expected to also provide screening. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

C2 (*Collection of community centres including Bishopstown Library, St. Joseph's Roman Catholic Church, SMA Wilton Parish Centre and Cork Camera Group. Located along L-90713 (Cardinal Way*). Located northeast from site.) Distance from nearest site boundary = 1325m

A small collection of community centres. These centres are oriented to the south, away from the site. The landscape directly surrounding this receptor is largely suburban, comprising large residential estates and commercial facilities. Vegetation cover is low, comprising treelines to the south - southwest of the receptor group.

Sensitivity The receptors are visitors and workers within these centres. Sensitivity is ***low.***

Magnitude Views towards the site are expected to be fully screened by the existing nearby residential estates such as R16 and commercial receptors such as CO3. If the proposed development is visible from this receptor, it will be glimpses from gaps in the existing dense built environment. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

C3 (*Cork University Hospital located along the R-849 (Bishopstown Road*). Located northeast from site.) Distance from nearest site boundary = 1414m – 1831m

Cork University Hospital is a large university teaching hospital. It serves as one of two major trauma centres for Ireland. The centre is generally oriented to the southeast, away from the site. The landscape directly surrounding this receptor is largely suburban, comprising large residential estates and commercial facilities. Vegetation cover is low, comprising treelines to the south – southeast along the north side of R-849.

Sensitivity The receptors are patients and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the site are expected to be largely screened by the existing nearby residential estates such as R15, R16 and commercial receptors such as CO3. If the proposed development is visible from this receptor, it will be glimpses from gaps in the existing dense built environment. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

C4 (*Bishopstown GAA Club, Woodleigh Park and the Highfield Rugby Club. Located northeast from site.*) Distance from nearest site boundary = 1245m – 1520m

A collection of sports pitches. Vegetation cover is sparse. The landscape directly surrounding this receptor is largely suburban, comprising large residential estates and commercial facilities.

Sensitivity The receptors are visitors, club members and workers within the site. Sensitivity is ***low.***

Magnitude Views are limited on average eye-height level. Views towards the site are therefore expected to be fully screened by

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the existing nearby residential estates such as R15 and other distant built features within the suburban landscape. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***negligible*** during operation and ***negligible*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

C5 (*Bishopstown Community School, Located along L-1017 to the west and L-50871 to the east. Located northeast from the site*) Distance from nearest site boundary = 1130m

A secondary school with a large open green area adjoining it. The school is generally oriented to the east – west, away from the site. Vegetation cover is low, with the highest density located along the west, southwest boundary of the receptor group. The landscape directly surrounding this receptor is largely suburban, comprising large residential estates such as R14 and 15.

Sensitivity The receptors are visitors, club members and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the site are expected to be fully screened by the existing nearby residential estates such as R15 and other distant built features within the suburban landscape. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***negligible*** during operation and ***negligible*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

C6 (*Cork College of FET Bishopstown Campus, Located along L-5109. Located north from the site*) Distance from nearest site boundary = 1420m

A campus specialised in upskilling, and reskilling learners. The campus is generally oriented to the west – south, towards the site. Vegetation cover is low, comprising tall deciduous trees spaced intermittently along the boundary of the receptor group. The landscape directly surrounding this receptor is largely suburban, comprising large residential estates such as R14 to the south and community facilities such as C7 to the southwest.

Sensitivity The receptors are visitors, club members and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the site are expected to be largely screened by the existing nearby residential estates such as R14 and other distant built features within the suburban landscape such as C7. At most, glimpsed views of the tallest elements of the proposed development may be seen between gaps of intervening properties. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

C7 (*Cork College of FET Bishopstown Campus, Located along L-5109. Located north from the site*) Distance from nearest site boundary = 1420m

A campus specialised in upskilling, and reskilling learners. The campus is generally oriented to the west – south, towards the site. Vegetation cover is low, comprising tall deciduous trees spaced intermittently along the boundary of the receptor group. The landscape directly surrounding this receptor is largely suburban, comprising large residential estates such as R14 to the south and community facilities such as C7 to the southwest.

Sensitivity The receptors are visitors, club members and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the site are expected to be largely screened by the existing nearby residential estates such as R14 and other distant built features within the suburban landscape such as C7. At most, glimpsed views of the tallest elements of the proposed development may be seen between gaps of intervening properties. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

C8 (*UCC Playing Fields and University Technology Centre Located along L-2262 to the southwest and L-1016 to the south. Located northwest from the site*) Distance from nearest site boundary = 690m – 1400m

A collection of campus playing fields. Vegetation cover is low, comprising tall deciduous trees spaced intermittently bounding the sports pitches of the receptor group. A University Centre specialised in technology is located at the southern boundary of the receptor group, oriented southeast – northwest away from the site. The receptor is surrounded at a transition between suburban and rural. To the east the landscape is largely suburban, comprising large residential estates such as R15 and R16. To the west the landscape becomes rural, comprising large plots of fields bounded by treelines and hedgerows.

Sensitivity The receptors are visitors, club members and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the site are expected to be largely screened by intervening existing nearby residential estates such as R15 and R16. At most, glimpsed views of the tallest elements of the proposed development may be seen between gaps of intervening properties. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

C9 (*Maymount University Hospital Located along Maymount road adjoining L-2222 to the northwest. Located west from the site*) Distance from nearest site boundary = 660m

The Maymount University Hospital is oriented in multiple directions. Vegetation cover is moderately dense, comprising mixed tall deciduous trees and hedgerows along bounding the receptor group. The receptor is surrounded by rural landscape, comprising large plots of fields bounded by hedgerows and treelines. Small groups of residential properties are also present within the rural landscape, such as R5 located east of the receptor group.

Sensitivity The receptors are patients, students and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the site are expected to be largely screened by intervening layers of treelines and hedgerows bounding the distant rural fields. Additionally, receptors R5 is located in the direction of the receptors view of the site, providing year-round screening. At most, glimpsed views of the tallest elements of the proposed development may be seen between gaps of intervening properties and vegetation. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

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5.7.2.3 Commercial receptors

CO1 (*A large collection of commercial facilities located along the N71 and adjoining local roads*. Located east from the site) Distance from nearest site boundary = 12m – 535m

These commercial facilities are oriented east – west along the N71. Large carparks are interspersed with these facilities. Vegetation cover is generally low, with higher densities located to the northeastern section of the receptor group. This consists of deciduous trees lining along a section of the N71 before entrance to the large shopping centre. The landscape surrounding this receptor is at a transition between suburban and rural. To the north, the landscape is largely suburban, comprising large residential estates and commercial facilities. To the south of the receptor group, the landscape becomes rural. This is comprised of large plots of fields bounded by treelines and hedgerows.

Sensitivity The receptors are visitors shopping and workers within the site. Sensitivity is ***low.***

Magnitude Facilities closest to the site are largely facing away the site, with carparks located nearby the boundary of the site. Facilities further away are screened by the proposed development by intervening adjacent commercial facilities. It is expected that the proposed developments' tallest element to be seen above the intervening facilities. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

CO2 (*Doughcloyne Industrial Estate located along Doughcloyne Industrial Estate Road adjoining L-2450 to the east*. Located west from the site) Distance from nearest site boundary = 930m – 1450m

These commercial facilities are oriented in multiple directions. Carparks ranging from small to medium size are interspersed throughout the receptor group. The landscape surrounding this receptor is suburban. This consists of large residential estates such as R19 to the south and R21 to the northeast. Further south the landscape transitions to a rural type. This consists of large plots of fields bounded by tall treelines and hedgerows.

Sensitivity The receptors are visitors shopping and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the proposed development site are screened by the proposed by intervening adjacent commercial facilities within the receptor group and residential estates R19. It is expected that the proposed developments' tallest element could be seen above the intervening facilities. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

CO3 (*A large collection of commercial facilities along R641 to the east and R849 to the north*. Located northeast from the site) Distance from nearest site boundary = 1200m – 1650m

These commercial facilities are oriented in multiple directions. Carparks ranging from medium to large in size are interspersed throughout the receptor group. The landscape surrounding this receptor is suburban. This consists of large residential estates such as R16 to the southwest and R18 to the northeast. A large plot of open green space separates two commercial facilities from the south to the north. Vegetation cover comprises tall evergreen trees providing year-round screening.

Sensitivity The receptors are visitors shopping and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the proposed development site are screened by intervening adjacent commercial facilities within the receptor group and residential estates R16. Additionally, existing built receptors located nearby the proposed development such as CO1 and R19 is expected to provide screening. At most possible glimpsed views of the proposed developments' tallest element could be seen above the intervening facilities estates. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

CO4 (*IDA Cork Business & Technology Park, located along R608 to the south*. Located north from the site) Distance from nearest site boundary = 1200m – 1650m

These commercial facilities are oriented in multiple directions. Carparks ranging from medium to large in size and are interspersed throughout the receptor group. Vegetation cover within the receptor group is moderately dense. This consists of dense evergreen treelines surrounding the boundary of the receptor group, providing year-long screening. The landscape surrounding this receptor is suburban. This consists of large residential estates such as R16 to the southwest and R18 to the northeast. A large plot of open green space separates two commercial facilities from the south to the north. Vegetation cover comprises tall evergreen trees providing year-round screening.

Sensitivity The receptors are visitors shopping and workers within the site. Sensitivity is ***low.***

Magnitude Views towards the proposed development site are screened by intervening adjacent commercial facilities within the receptor group and residential estates R13 and R14 as well as nearby community facilities such as C6 and C7. Additionally, the existing vegetation cover surrounding the receptor group provides year-long screening limited long ranging views. At most, possible glimpsed views of the proposed developments' tallest element could be seen above the intervening facilities estates. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be ***low*** during operation and ***low*** during construction.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

5.7.2.4 Open space receptors

OS1 (*An open green area between receptors R19 and CO2 accessed through Garrane Dara estate*. Located east from the site) Distance from nearest site boundary = 885m

The green area is surrounded by a dense, mainly deciduous wooded area. No vegetation within the open green area itself. In the wider landscape, the area is within a predominantly suburban landscape. This consists of large residential estates and commercial Business parks. Further south of the receptor, the landscape becomes rural, comprising large plots of fields bounded by dense treelines and hedgerows.

Sensitivity The receptors are visitors engaging in outdoor activities and visual amenity offered by the area. Sensitivity is ***high.***

Magnitude The open space receptor is largely screened from surrounding views by the dense wooded area surrounding it. Additionally, the existing built environment within the wider landscape provides screening of the proposed development site.

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Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change is still expected to remain unchanged however, due to the existing built environment. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction

OS2 (*An open green area between R641 and a sideroad leading into CO2 accessed through Garrane Dara estate*. Located east from the site) Distance from nearest site boundary = 885m

The green area is surrounded by sideroads and regional roads leading into the N4. A few deciduous trees are within the open green area, providing limited screening. In the wider landscape, the area is within a predominantly suburban landscape. This consists of large residential estates and commercial Business parks. Long-ranging views are therefore heavily limited to roadways.

Sensitivity The receptors are visitors engaging in outdoor activities. Sensitivity is ***medium.***

Magnitude The open space receptor is largely screened from surrounding views by the densely built suburban environment. These include receptors CO2, CO3 and R21. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***negligible during operation and negligible during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

OS3 (*An open green area located west of Summerstown Grove along the eastern boundary of R18*. Located northeast from the site) Distance from nearest site boundary = 1900m

The green area is surrounded by suburban landscape, comprising of two-storey residential estates. This limits long-ranging views of the surrounding environs to nearby roads. A few deciduous treelines are within the open green area, cutting diagonally across.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the open space. Sensitivity is ***high.***

Magnitude The open space receptor is largely screened from surrounding views by the collection of residential estates within R18. Views are also limited to average eye height, reducing the visibility of the site to be fully screened. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***neutral during operation and neutral during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

OS4 (*An open green area located along L-90713 within R16*. Located northeast from the site) Distance from nearest site boundary = 1030m

The green area is surrounded by suburban landscape, comprising of two-storey residential estates. The open area is bounded by tall, mature deciduous trees intermittently spaced. A particularly dense treeline is located along the southern boundary of the open area, separating the receptor from the N40.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the open space. Sensitivity is ***high.***

Magnitude The open space receptor is largely screened from surrounding views by the collection of residential estates within the wider landscape. Additionally, the treeline along the southern boundary of the receptor group limits long ranging views towards the site. Views are also limited to average eye height, reducing the visibility of the site to be fully screened.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change is still expected to remain unchanged however, due to the existing built environment. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, imperceptible, negative*** during operation and ***temporary, imperceptible, negative*** during construction

OS5 (*An open green area located along L-5270 and L-50382 within R16*. Located northeast from the site) Distance from nearest site boundary = 345m – 930m

The open area is surrounded by suburban landscape, comprising of two-storey residential estates. The open area is bounded by tall, mature deciduous trees intermittently spaced. A particularly dense treeline is located along the southern boundary of the open area, separating the receptor from the N40.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the open space. Sensitivity is ***high.***

Magnitude The open space receptor is largely screened from surrounding views by the collection of residential estates within the wider landscape. Additionally, the treeline along the southern boundary of the receptor group limits long ranging views towards the site. Views are also limited to average eye height, reducing the visibility of the site to be fully screened.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change is still expected to remain unchanged however, due to the existing built environment. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

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OS6 (*An open green area located along L-50373 to the north and L-5037 to the east and L-50374 to the west*. Located north from the site) Distance from nearest site boundary = 75m – 175m

This open area is surrounded by suburban landscape, comprising of two-storey residential estates. The open area is bounded by tall, mature deciduous treelines along the western, southern and eastern boundary. A particularly dense treeline is located along the southern boundary of the open area, separating the receptor from the N40.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the open space. Sensitivity is ***high.***

Magnitude Despite the open space being surrounded by suburban landscape, further south towards the site contains no existing residential properties that could screen the site. The dense treelines along the N40 serves as the only screen of the site. Because of this, it is expected that views of the tallest elements of the site and partial views of the site could be viewed by receptors. During construction phase, partial views of moving material and plant machinery may intrude a portion of the overall view. Views are limited to average eye height, slightly reducing the visibility of the site.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change could worsen as more views become available. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

OS7 (*An open green area located along L-50371 to the south and L-50372 to the north*. Located north from the site) Distance from nearest site boundary = 220m – 275m

This open area is surrounded by suburban landscape, comprising of two-storey residential estates. The open area is bounded by tall, mature deciduous treelines along its boundary. These trees are spaced intermittently providing some screening for elevated views and consists of mainly tall deciduous trees.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the open space. Sensitivity is ***high.***

Magnitude The open space is largely screened by the surrounding suburban landscape, limiting available views to the tallest elements of the proposed development. This is expected to intrude a small portion of the overall view, however.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change is still expected to remain unchanged however, due to the existing built environment. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

OS8 (*An open green area located along L-1016 to the south, L-99186 and L-50380 to the east*. Located northwest from the site) Distance from nearest site boundary = 590m – 660m

This open area is flanked by suburban landscape, comprising of two-storey residential estates. The landscape becomes more rural to the south, comprising open plots of agricultural/pastoral fields bounded by dense treelines and hedgerows. The open area contains tall, mature deciduous trees that are intermittently spaced. A dense treeline is located along the southern boundary of the open area, separating the receptor group from the N40.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the open space. Sensitivity is ***high.***

Magnitude The open space is largely screened by the suburban landscape, limiting available views to the tallest elements of the proposed development. This is expected to intrude a small portion of the overall view, however. Additionally, potential views of the site must be angled, which are screened by the suburban landscape.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change is still expected to remain unchanged however, due to the adjacent existing built environment. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

OS9 (*An open green area located along L-50375 to the west and L-50378 to the north, east and south*. Located northwest from the site) Distance from nearest site boundary = 215m – 390m

This open area is surrounded by suburban landscape, comprising of two-storey residential estates. The open area contains tall, mature deciduous trees that are intermittently spaced.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the open space. Sensitivity is ***high.***

Magnitude The open space is largely screened by the suburban landscape, limiting available views to the tallest elements of the proposed development. This is expected to intrude a small portion of the overall view, however. The available screening offered by the existing vegetation provides limited screening and is expected to slightly reduce the visual impact.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change is still expected to remain unchanged however, due to the surrounding existing built environment. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

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5.7.2.5 Walk routes and Cycle routes

Cork to Kinsale and back along winding roads (*A Cycle route following along the N71 within the study area.* Located southeast, east, northeast from the site) Distance from nearest site boundary = 260m – 2000m

This cycle route makes loop from Cork to Kinsale. Vegetation cover is varied, with less vegetation to the northeast where the route passes through Cork city comprising only urban facilities and properties. To the south, where the landscape becomes rural, vegetation cover becomes moderately dense comprising dense treelines and hedgerows bounding large plots of agricultural/pastoral fields. The main attraction of this route is the beauty of the countryside as well as passing through popular spots throughout Cork City.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the Cycle route. Sensitivity is ***high.***

Magnitude Views towards the site within the rural landscape, is largely fully screened from intervening treelines and hedgerows. Views within the suburban landscape to the northeast contain partial views of the site, limited to the tallest elements of the proposed development. This is expected to intrude a small portion of the overall view, however.

Seasonal variations in vegetation cover will influence the extent to which the proposed development remains visible throughout the year. During Winter, when deciduous vegetation is less effective, it is expected that the proposed development will become more prominent. The magnitude of change is still expected to remain unchanged however, due to the dense layering of treelines and hedgerows within the rural landscape. The visual impact of the proposed development during Winter would be low. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

Cork to St. Helens (*A Cycle route following along the local and regional road from Cork to Wexford.* Located southeast, east, northeast from the site) Distance from nearest site boundary = 1065m – 2000m

This cycle route starts from R15 and moves further northeast to Wexford. Vegetation cover is varied, with more vegetation at its starting location containing plots of open green spaces containing trees, and treelines. To the northeast where the route passes through Cork city, the only level of screening is provided by the existing built environment comprising urban facilities and residential properties. The main attraction of this route is the beauty of the countryside as well as passing through popular spots throughout Cork City.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the Cycle route. Sensitivity is ***high.***

Magnitude Views towards the site along the suburban/city landscape, is largely fully screened from intervening properties and occasional treelines. This limits to views of the tallest elements of the proposed development, intruding a small portion of the overall view. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

Wander through West Cork Bishopstown Stadium Loop (*A trail loop following the L-2222, extending west before curving southeast through Ballynora and returning northeast near Ballymah.* Located west and southwest from the site) Distance from nearest site boundary = 760m – 2000m

The surrounding landscape is predominantly rural, comprising of treelines and hedgerows bounding distant plots of medium to large fields. Views are mainly limited along the roadway. Occasional residential settlements are present along the route, offering tall screening from properties. The main attraction of this route is the beauty of the countryside.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the Cycle route. Sensitivity is ***high.***

Magnitude Views towards the site along the trail, is largely fully screened from intervening properties and dense treelines and hedgerows. This limits to glimpsed views of the tallest elements of the proposed development, intruding a small portion of the overall view. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

Coastal serenity Bishopstown Haven Coast walking route (*A walking route starting from St. Joseph's Parish Church Wilton towards the Cork Lough before looping back to the starting location.* Located northeast from the site) Distance from nearest site boundary = 1435m – 2000m

The surrounding landscape comprises a suburban type. This consists of large residential estates up to two-storeys in height. Vegetation cover is low, mainly consisting of dense treelines along residential roads or within open green areas. The main attraction of this route is the beauty of the Lough further northeast as well as the attractions along the way towards it.

Sensitivity The receptors are visitors engaging in outdoor activities and the visual amenity offered by the walking route. Sensitivity is ***high.***

Magnitude Views towards the site along the trail, is fully screened from intervening properties from receptors R18 and R21 and the low density of vegetation within green open areas. This limits to glimpsed views of the tallest elements of the proposed development, intruding a small portion of the overall view. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be ***low during operation and low during construction***.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be ***permanent, slight, negative*** during operation and ***temporary, slight, negative*** during construction.

5.8 The 'Do Nothing' Scenario

In the event the proposed development is not constructed, no change is expected to the landscape and visual amenity of the site. Any expected changes to the existing vegetation due to maturity are not expected to have any negative nor positive impact in the short- or long-term.

The Do-Nothing option may result in pressure on the Cork City Area for development of other sites for housing and stem progress of objectives outlined in the Cork CDP. As the land has been zoned for sustainable residential development the Do-Nothing option is not considered further in this report.

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5.9 Potential Significant Effects

5.9.1 Demolition Phase

5.9.1.1 Landscape

The proposed development will change the fabric within the boundaries of the proposed development. No existing structures are within the threshold of the site. The removal of certain sections of hedgerows and existing treelines along the boundary of the site are expected to slightly affect the landscape character and increase the visibility of the site. The overall field pattern is retained, with the inclusion of the heritage wall in the overall proposed design. **No significant negative impacts are expected.**

5.9.1.2 Visual Impact

Surrounding receptors of the site are residents of dwellings and are *highly* sensitive. The magnitude of these visual changes will include changes in treeline and hedgerows, with few remaining hedgerows and treelines remaining. Therefore, the magnitude of change will range from *low to medium.* The highest negative visual impacts are expected to be *moderate and* would be restricted to the residential receptors located in closer proximity to the proposed development boundary works such as R1 and R3. **These impacts are not significant.**

5.9.2 Construction Phase

5.9.2.1 Landscape

The construction phase will include the temporary addition of welfare units within the site, as well as the addition of materials that will be stockpiled within the site. Machinery will be included. Waste disposal areas will be designated within the site. Changes upon the landscape will include debris, soil removal and loss of some vegetation. The addition of temporary security fencing would also have a negative impact on the landscape. **This is expected to be temporary and not significant**.

5.9.2.2 Visual Impact

Surrounding receptors are residents which are of *high* sensitivity. The elements of visual changes upon the views will include the removal of soil and some vegetation, as well as the introduction of welfare units, material stockpiles, equipment and machinery. For receptors located further from the site, the visual impact is expected to be slight, as existing hedgerows, treelines, and elements of the built environment will remain in place, effectively filtering or screening views of the construction activity. For receptors in closer proximity to the site, such as R1 and R3, a *moderate* visual effect is anticipated due to the more extensive vegetation clearance in these areas and increased visibility of construction activity, including movement of plant and equipment. **These impacts are not significant.**

5.9.3 Operational Phase

5.9.3.1 Landscape

The proposed development will change the fabric of the landscape within its boundaries by converting the greenfield into a residential area, slightly altering the rural and semi-rural character. The introduction of 246 no. residential units will increase the built density and increase the urban elements along L-5037 (Waterfall Road). This is at a density that appears proportional to the existing built environment, for a site that is zoned for sustainable residential development. Therefore, the impact to the landscape is expected to be *slight*. **This impact is not significant**.

5.9.3.2 Visual Impact

During the operational phase, the surrounding receptors are expected to have their visual amenity affected. Vegetation removed during construction will allow for clearer views of the site during operational phase. However, adjacent built structures and intervening vegetation will continue to provide screening, particularly for receptors further from the site. For receptors in closest proximity, such as R1 and R3, the greatest visual impact during operation is expected to be *permanent and slight negative*. This is primarily due to the presence of moderately dense vegetation surrounding these receptors and the fact that many of the properties are oriented away from the site. **These impacts are not significant**.

5.9.4 Cumulative Effects

Cumulative impact is the incremental impact created by the proposed development in the context of surrounding land uses, recent changes and considered future development. This chapter will focus on the cumulative visual effects of similarly granted proposed developments as well as the impact upon the landscape on the potential changes to the rural and suburban settings. In this chapter, only the foreseeable future works are assessed.

Application 310274: To the west of the proposed development a similar development comprising 276 (137 no. houses, 139 no. apartments), creche along Waterfall Road. Located immediately adjacent to the proposed development site, it is expected that the cumulative visual and landscape effects will be similar to that of the proposed development. The site is currently underway of being constructed. This development is effectively screened by the existing built environment and is expected to alter the semi-rural character of the view from surrounding receptors. Receptors R3, 4 and 5 are expected to be the most affected, as these residential receptors are located along the northern boundary of the proposed development. In conjunction with the proposed development, it is expected that the cumulative visual impact to be *slight* during construction and operation for receptors nearest to the similarly proposed development as these receptors are facing away the site.

Overall, **no significant negative cumulative effects** are expected to occur from the proposed works in conjunction with other proposed developments.

5.9.5 Summary

There are **no significant negative effects**, temporary nor permanent expected to arise from the proposed development. The highest impacts as assessed are *temporary, moderate, negative* and are expected to impact the views of the residencies that are in close proximity of the proposed development where existing vegetation is to be removed.

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5.10 Mitigation Measures

While no significant landscape or visual impacts are expected during all phases of the proposed development, it is recommended to reduce receptors vulnerable to *moderate* visual impact during construction. These receptors are R1 and R3, which are in closest proximity of all receptors to the site (Table 3). Mitigation measures include the provision of 2.5m palisade walls made of solid timber with no viewing gaps between them surrounding the boundaries of the affected receptor groups. After construction phase, it is recommended to reinforce the existing treelines by including tall tree planting with high content of evergreen species along the boundaries touching the proposed development.

Table 5.3 Most vulnerable visual receptors

Receptor No.	Title of receptor	Distance from site	Sensitivity	Magnitude of change	Construction predicted impact and duration	Operational predicted impact and duration
R1	Rathgowan Wood	0 m	High	Low -Med	Temporary, moderate, negative	*Permanent, slight, negative*
R3	Rathgowan Woods, Ardilaun Heights	0 m	High	Low -Med	Temporary, moderate, negative	Permanent, slight, negative

5.11 Residual Impact Assessment

The post mitigation impact of receptors R1 and R3 results from *moderate* to *slight.* The palisade walls will provide effective screening and noise reduction during construction, as well as the evergreen trees allowing year-round screening after construction works.

Table 5.4 Residual effects after mitigation

Receptor No.	Title of receptor	Distance from site	Sensitivity	Magnitude of change	Construction predicted impact and duration	Operational predicted impact and duration
R1	Rathgowan Wood	0 m	High	Low -Med	*Temporary, moderate, negative*	*Permanent, slight, negative*
R3	Rathgowan Woods, Ardilaun Heights	0 m	High	Low -Med	Temporary, moderate, negative	Permanent, slight, negative

5.12 Risk of Major Accidents or Disasters

No risks of major accidents or disasters have been identified during this assessment.

5.13 Interactions

Elements of the Cultural Heritage and Biodiversity chapters may interact with the Landscape and Visual amenity offered in this location. These are the designated monuments surrounding the proposed development site and the proposed vegetation as part of enhancement and replacement of loss of existing vegetation. The interactions are expected to be *negligible* and therefore **not significant**.

5.14 Monitoring

Monitoring elements have not been included due to mitigation measures not being required.

5.15 Summary of Mitigation and Monitoring

No mitigation, and therefore no monitoring, is required.

5.16 Conclusion

The proposed development site is located along the southwestern fringes of Cork City, approximately 6 km from the city centre. The site is adjacent to the Waterfall Road which forms the northern boundary. Beyond this road to the north is the N40. The N71 is also located approximately 245m east of the site.

The proposed development site consists of a vacant greenfield with open grasslands, enclosed and divided by mature hedgerows and trees. A single hedgerow also runs through the site, containing traces of stone walls.

According to the Cork City Development Plan 2022-2028 (CDP) and Draft Landscape Strategy 2007 (LCA), the proposed development site is located within the landscape character type 1 – City Harbour and Estuary. The land cover consists of regularly shaped medium to large fields with mature broadleaf hedgerows, primarily used for intensive dairying, agriculture, and tillage. Both the landscape value and sensitivity are 'Very high', and importance rated as being of 'National' level.

There are no protected views and prospects, or scenic routes within 2km of the proposed development site. One panoramic viewpoint lies 3km to the south. This is the Five County View viewpoint with long-range panoramic views reaching to the edges of Co. Kerry, Co. Limerick, Co. Tipperary and Co. Waterford. There are thirteen (13no.) national monuments located within 1km of the proposed development site, however they are sited within private and generally enclosed lands.

The proposed development will change the fabric of the landscape within its boundaries by converting greenfield/agricultural fields into a residential area, slightly altering the semi-rural character. The introduction of 246 no. residential units will increase the built density and increase the urban elements along Waterfall Heights Road. This is at a density that appears proportional to the existing, for a site that is zoned for residential. According to the methodology and taking account to the proposed design, the overall impact to the landscape is expected to be *temporary*, *slight* to *moderate, negative* during construction phase to *permanent, slight, negative* during operational phase.

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Surrounding receptors of the site are residents of dwellings and are highly sensitive. The magnitude of these visual changes will include changes in treeline and hedgerows, with few remaining hedgerows and treelines remaining. Therefore, the magnitude of change will range from *low* to *medium*. The highest negative visual impacts are expected to be *moderate* during demolition and construction and would be restricted to the residential receptors located in closer proximity to the proposed development boundary works such as R1 and R3. These impacts are not significant. Vegetation removed during construction will allow for clearer views of the site during operational phase. However, adjacent built structures and intervening vegetation will continue to provide screening, particularly for receptors further from the site. For receptors in closest proximity, such as R1 and R3, the greatest visual impact during operation is expected to be *permanent* and *slight negative*.

The cumulative effects arising from the proposed development in the context of the surrounding land are expected to be *slight* due to the scale and siting of application 310274 to the west, in relation to the proposed developments.

Overall, no significant negative landscape and visual effects, as well as cumulative effects, are expected to occur.

5.17 References and Sources

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;

Guidelines for Landscape and Visual Impact Assessment (GLVIA) as published by the Landscape Institute (UK) and the Institute of Environmental Management and Assessment (3rd Edition, 2013);

Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment, third edition (GLVIA3), as published by the Landscape Institute (UK) (2024);

National Landscape Strategy 2015-2025; Department of the Environment, Community and Local Government;

Guidelines on Landscape and Visual Assessment (2002); Irish Landscape Institute (ILI);

Cork City Development Plan 2022-2028

Cork County Development Plan 2022-2028;

Cork County Draft Landscape Strategy (2007);

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CHAPTER SIX

MATERIAL ASSETS: TRAFFIC & TRANSPORT

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McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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CHAPTER 6 | Material Assets: Traffic & Transport

6.1 Introduction

MHL & Associates Ltd., Civil Engineering Consultants, undertook the preparation of this section of the Environmental Impact Assessment Report (EIAR), in association and consultation with McCutcheon Halley, Deady Gahan, JBA and Modelworks, O'Shea Leader, AWN, JBA, Enviroguide and Lane Purcell.

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared to assess the potential impact of the proposed development on traffic and transport. It provides an overview of the existing environment, including the current road network, traffic conditions, and surrounding transport infrastructure. A comprehensive and robust assessment of the potential effects on the local road network has been undertaken, covering both the short-term construction phase and the long-term operational phase of the development. Additionally, the chapter outlines mitigation measures aimed at minimising or avoiding significant impacts on traffic flow and road safety.

The Traffic and Transport Assessment has been prepared by MHL Consulting Engineers Ltd., who have extensive experience in Transport Statements, Transport Assessments, and development proposals across Ireland. This document should be read in conjunction with the accompanying Transport Assessment, which includes a Mobility Management Plan as part of the planning application.

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on the local traffic and transportation network, as well as the surrounding environment. It evaluates how the project may influence traffic patterns, pedestrian safety, and air quality, while also considering the effects on nearby communities and infrastructure. The assessment aims to identify any potential adverse impacts arising from increased traffic volume and movement during both the construction and operational phases, ensuring that effective mitigation strategies are proposed to promote a safe, efficient, and sustainable transportation environment.

It should be read in conjunction with reference other relevant Chapters of this EIAR, inclusive of supporting assessments, reports, and plans submitted as part of this application.

6.2 Expertise and Qualifications

The Traffic and Transport Assessment has been prepared by qualified transport engineers and planners with expertise in traffic modelling, transport impact assessment, and infrastructure planning. The team is experienced in preparing EIAR chapters in line with the Design Manual for Urban Roads and Streets (DMURS, 2019) and other relevant guidelines such as TII's Traffic and Transport Assessment Guidelines (2014), ensuring the highest standards are adhered to.

This chapter of the EIAR was prepared by Mr. David Murphy, B.Eng. (Hons), M.A, MIEI, of MHL & Associates, and reviewed by Mr. Brian Murphy, BE, CEng MIEI of MHL & Associates.

David holds an Honours Bachelor's Degree in Civil, Structural and Environmental Engineering, with a Masters in Coastal Management and Geographical Information Systems. David has 14 years' experience working in the fields of transport planning, traffic engineering and traffic management. David has carried out numerous Traffic and Transportation Assessments, Traffic Statements, Mobility Planning and has been involved in the preparation of EIARs for the following projects:

- Ringwood LRD Phase 01
- Ringwood LRD Phase 02
- Convent Avenue EIAR

6.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 "Site Location and Proposed Development" of this EIAR. In summary, the applicant seeks permission for the following Large Scale Residential Development (LRD).

The proposed development will consist of:

- The construction of 246 no. residential units, comprising a mix of 1,2,3 and 4 bed semi-detached, townhouses, duplexes and apartments.
- A creche.
- The provision of landscaping and amenity areas and all associated infrastructure and services to include a vehicular and pedestrian/cycle access point, roads, parking, lighting and drainage.

The proposed development will see the extension of the Ardarostig residential area and will promote compact growth in a location contiguous to the existing urban footprint where it can be served by public transport, walking and cycling. The applicant is the owner of the adjoining site to the west, which is a permitted SHD site where c. 275 no. units were permitted. The majority of these units are constructed and occupied to date.

6.4 Methodology

The methodology follows a structured approach based on relevant guidance and best practice for transport impact assessment.

In Ireland, there are currently no definitive guidelines or standards for quantifying or describing the effects of traffic and transport in the context of Environmental Impact Assessments (EIA). However, Transport Infrastructure Ireland (TII) provides Traffic and Transport Guidelines that indicate if the traffic impact from a new development is expected to exceed 10% of existing traffic movements, it is considered material regarding the local network. In sensitive areas, this threshold is reduced to 5%.

In the UK, the Institute of Environmental Management and Assessment (IEMA) offers additional guidance in its publication, Environmental Assessment of Traffic and Movement (2023). The IEMA recommends two broad rules to help determine the scale and extent of assessments: if traffic (or heavy goods vehicles) increases post construction by more than 30%, a more detailed assessment is warranted, while a 10% increase threshold is advised for sensitive locations. According to the IEMA Guidelines, various indicators are utilised to assess the significance of relief from severance. Changes in traffic flow of 30%, 60%, and 90% are categorised as producing 'slight', 'moderate', and 'substantial' changes, respectively. The guidelines also indicate that increases in traffic flow of less than 10% on uncongested roads are considered 'not significant' since daily variations in background traffic can fluctuate within this range.

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The following section outlines the methodology used to assess the significance of effects at locations along the proposed routes within the study area, focusing on those where total traffic levels exceed the screening thresholds established by IEMA. If operational traffic impacts exceed 30% on any particular link or 10% on sensitive links, a detailed assessment of the significance of the effect is conducted. This assessment considers link sensitivity and the magnitude of change, considering criteria set out in the IEMA Guidelines, including severance, driver delay, pedestrian delay, pedestrian amenity, and safety.

6.4.1 Sensitivity

The sensitivity of a road segment to changes in traffic levels, as well as the receptors located along that segment, is typically evaluated by examining the residual capacity of the network under current conditions. When there is a substantial amount of residual capacity, the network can easily accommodate an increase in traffic, indicating low sensitivity to change. In contrast, if existing traffic levels are close to the road's capacity, leaving minimal spare capacity, the sensitivity to fluctuations in traffic levels is considered high.

The criteria used to assess the sensitivity of the receptors, and the magnitude of change are summarised in Table 6.1.

Table 6.1 Framework for Determining Sensitivity of Receptors

Sensitivity	Description
High	The receptor/resource has limited capacity to accommodate change without fundamentally altering its current character and is of national or international significance. This includes local residents reliant on unrestricted movement in their environment, as well as receptors such as schools, colleges, hospitals, and accident-prone areas.
Medium	The receptor/resource can moderately accommodate change without significantly affecting its existing character and holds considerable importance.
Low	The receptor/resource can tolerate change without impacting its character and is of low or local significance. This includes areas like trunk roads or 'A' class roads designed to handle substantial heavy goods vehicle (HGV) volumes.
Negligible	Users are not sensitive to transportation impacts. This category encompasses very small settlements and roads without significant populations, including new strategic trunk roads or motorways.

6.4.2 Magnitude

The magnitude of effects is a function of the existing traffic volume, the percentage increase and change due to the proposed development, changes in the type of traffic and the temporal distribution of traffic (day of week, time of day).

The determination of magnitude has been undertaken by reviewing the proposed development, establishing the parameters of the receptors that may be affected and quantifying these effects utilising guidelines and professional judgement. Consideration is given to the composition of the traffic on the road network, under both existing and proposed conditions. For example, LGVs have less effect on traffic and the road system than HGVs. Similarly, HGVs can have less effect than abnormal load vehicles, depending on the frequency of the abnormal loads. The criteria that have been used to make judgement on the magnitude of the effect on the receptor(s) as presented in Table 6.2.

Table 6.2 Framework for Determining Magnitude of Effects

Major
Complete loss of, or significant alteration to, essential elements/features of the baseline (pre-development) conditions, resulting in a fundamental change to the post-development character, composition, or attributes. Typically, a change in traffic exceeding 90% (or over 70% at sensitive receptors) is classified as a major magnitude.
Moderate
Loss or alteration of one or more key elements/features of the baseline conditions, leading to a substantial change in the post-development character, composition, or attributes. A change in traffic between 60% and 90% (or between 40% and 70% at sensitive receptors) is regarded as moderate magnitude.
Minor
A slight deviation from baseline conditions. The change due to loss or alteration will be noticeable but not significant. The fundamental character, composition, or attributes of the baseline conditions will remain similar to those prior to development. Typically, a change in traffic ranging from 30% to 60% (or from 10% to 40% at sensitive receptors) is seen as a minor magnitude.
Negligible
Minimal change from baseline conditions. The change is hardly noticeable, resembling a situation of 'no change.' Typically, a change in traffic of less than 30% (or under 10% at sensitive receptors) is considered negligible magnitude.

6.4.3 Significance

To guide the assessment—though not as a replacement for professional judgment—the criteria for evaluating the significance of traffic-related effects are detailed in Table 6.3. This assessment is based on the combination of the effect's magnitude and the sensitivity of the receptor.

Table 6.3 Significance Criteria Matrix

	Magnitude of Change			
Sensitivity of Receptor	**Major**	**Moderate**	**Minor**	**Negligible**
High	Major	Major/ Moderate	Moderate	Minor
Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor
Low	Moderate	Moderate/ Minor	Minor	Negligible

Significance is classified as major, moderate, minor, or negligible. Effects assessed as minor or negligible significance are regarded as 'Not Significant.'

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6.5 Potential Environmental Effects

The assessment focuses on evaluating the potential environmental impacts associated with traffic and transport. The EPA EIAR guidelines (2022) provide several definitions to describe potential significant effects, including aspects related to the quality, significance, extent, probability, duration, frequency, and type of effects. While some of these can be clearly defined using the EPA guidelines, interpreting the significance of the effects depends on professional engineering judgment. The IEMA Guidelines identify several potential significant effects, including:

- Noise
- Driver delay
- Pedestrian delay
- Pedestrian amenity
- Accidents and safety
- Hazardous loads (e.g., chemicals, gas, etc)
- Dust and dirt

According to the IEMA guidance, to determine the scale and extent of the assessment and the impact of the Proposed Development on the surrounding road network, the following two 'rules' should be adhered to:

Rule 1 – Include highway links where traffic flows are expected to increase by more than 30% (or 10% if it impacts a sensitive area) or where the number of heavy goods vehicles (HGVs) is anticipated to rise by more than 30%.

Rule 2 – Include any specifically sensitive area where traffic flows are projected to increase by 10% or more.

Paragraph 2.5 of the IEMA Guidelines outlines groups, locations, and special interests that may be sensitive to changes in traffic conditions, which include:

- Residents
- Employees in workplaces
- Vulnerable groups such as children, the elderly, and individuals with disabilities
- Sensitive locations, such as hospitals, churches, schools, and historic buildings
- Individuals walking or cycling
- Open spaces, recreational areas, and shopping districts
- Sites of ecological or nature conservation significance, as well as tourist attractions

The significance of each effect is considered against the criteria within the IEMA Guidelines, where possible, however the guidelines state that:

> *"For many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed- up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources."*

6.5.1 Relevant Legislation & Guidance

The Traffic and Transport chapter of this Environmental Impact Assessment Report (EIAR) has been prepared in alignment with the assumptions outlined in the accompanying Traffic and Transport Assessment and relevant EIAR guidance documents. The chapter is informed by the following key guidelines:

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
- Institute of Environmental Management and Assessment (IEMA) Guideline: Environmental Assessment of Traffic and Movement (IEMA, 2023)
- PAG Unit 5.3: Travel Demand Projections (TII, 2019)
- Project Ireland 2040 – National Planning Framework
- Transport Infrastructure Ireland's (TII's) Traffic & Transport Assessment Guidelines (2014)
- Cork City Development Plan 2022-2028
- Design Manual for Urban Roads and Streets (DMURS) (updated 2019)
- National Cycle Manual (NTA, 2023)

These guidelines ensure that the assessment is consistent with national and European best practices and considers both current and future transport infrastructure needs.

6.5.2 Site Surveys/Investigations

Site visits and surveys were conducted to gather current traffic data, road conditions, and public transport usage. Data were collected over a typical weekday, covering peak and off-peak periods to ensure a representative sample of traffic patterns and transport activity. Traffic count surveys were conducted by Irish Traffic Surveys Ltd at identified junction/s on the adjacent road network.

6.5.3 Consultation

A Section 247 Pre-Application meeting was held with Cork City Council (CCC) on Monday 3rd March 2025. In addition, a Section 32B pre-planning meeting was held with representatives of Cork City Council on Friday 13th June 2025. Several follow up meetings have been held with members of CCC's Traffic and Transportation department, to discuss the methodology of both the EIAR and TTA.

The design team has engaged with key stakeholders, including Cork City Council, to address traffic and mobility concerns and ensure compliance with guidelines. From the local authority's feedback, a Traffic and Transport Assessment (TTA) was conducted in accordance with TII's 2014 guidelines, considering traffic volumes, key routes, and impacts on the adjoining road network. Sub-threshold requirements in Section 2.2 of the guidelines were also addressed. Additionally, a Road Safety Audit (RSA) evaluated potential safety impacts, particularly at nearby junctions. All assessments align with national best practices, emphasizing mitigation of significant road network impacts and ensuring safety and efficiency.

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6.6 Difficulties Encountered

No major difficulties were encountered during the assessment, although some minor limitations, such as seasonal variations in traffic data and public transport schedules, were noted. These were addressed by using industry-standard traffic modelling techniques to normalise the data. The available traffic data was comprehensive and current, allowing for an accurate analysis of local conditions. Additionally, on site validation during the teams site visits provided valuable insights into specific traffic patterns. This approach ensured a robust assessment of current and projected future traffic impacts and a thorough evaluation of sensitive receptor responses to changes in traffic levels. Overall, the process benefited from a strong foundation of data and supportive resources.

6.7 Baseline Environment

6.7.1 Receiving Environment

The following section provides a summary of the proposed development's receiving environment. Full details are included the submitted Traffic and Transport Assessment.

The receiving environment describes the current traffic conditions, road infrastructure, and the overall transportation network surrounding the proposed development site. This includes an assessment of existing traffic volumes, vehicle types, and peak travel times, as well as the conditions of local roads and their capacities. Additionally, it considers sensitive receptors in the vicinity, such as residential areas, schools, hospitals, and community facilities, which may be affected by increased traffic. The evaluation included pedestrian and cyclist infrastructure, public transport availability, and traffic safety issues, providing a comprehensive understanding of how the existing environment interacts with current traffic patterns. By establishing a clear baseline of the receiving environment, the assessment can effectively identify potential impacts of the proposed development and inform appropriate mitigation measures to minimise disruption to the surrounding community and infrastructure.

6.7.2 Site Location

The development site is located to the southwest of Bishopstown, along Waterfall Road, approximately 5km from the Cork City Centre and approximately 4km from Ballincollig, south of the N40 and east of the N71/ Bandon Roundabout. The surrounding road network in the vicinity of the site comprises of N40 South Ring Road, the N71, Bishopstown Road and Curraheen Road. The N40 is a national road linking Cork City to Kerry via the N22. The N71 is located east of the site, where the road is oriented in a north-south direction, travelling from the Bandon Road Roundabout on the South Ring Road to West Cork.

6.7.3 Transport Accessibility & Infrastructure

The proposed development site benefits from significant public transport connectivity, particularly through the 208-bus corridor along Curraheen Road, which provides direct access to the city centre for residents. Additionally, nearby bus stops at the Bandon Roundabout facilitate connections to the 236, 237, and 239 bus routes, enabling travel to West Cork towns such as Skibbereen, Glengarriff, and Bandon. Enhancing this connectivity, the BusConnects Cork initiative proposes several new bus routes in close proximity to the development.

The 208 is the nearest city-bound bus service, which runs every 10 minutes. Please refer to https://www.buseireann.ie/news/ for up-to-date information of serviced routes.

6.7.4 Road Network Infrastructure & Traffic Conditions

The local road network comprises a mix of primary, secondary, and tertiary roads, with varying levels of congestion depending on the time of day. Traffic counts and surveys indicate moderate to high volumes during peak periods.

6.7.5 Public Transport & Site Accessibility

The site can be served by city bus routes. However, some public transport routes are near capacity during peak hours, which could impact the development's future transport demand.

6.7.6 Pedestrian and Cycle Infrastructure

The site is located on the edge of the urban area with minimal cycle facilities currently provided in the vicinity. The expansion of the city will present a number of opportunities for the improvement of sustainable travel linkages throughout the wider city area. The "Cork Cycle Connects" sets out intended cycle network areas for the Cork Metropolitan Area.

New pedestrian facilities are present along Waterfall Road. Key elements of existing pedestrian infrastructure are:

N40 South Ring Road

The N40 South Ring Road is a major national primary road skirting the southern suburbs of Cork City, stretching from the N22 west of Ballincollig, through the Jack Lynch Tunnel under the River Lee, to the Dunkettle Interchange where it meets the N25 and N8/M8. It serves as a key commuter route and bypass for city centre traffic. Pedestrian infrastructure along the N40 is limited due to its design as a high-speed dual carriageway. Interchanges like Curraheen and Bandon Road Roundabout (junction with N71) offer limited pedestrian crossings, but these are not optimised for extensive foot or bike traffic. The road's primary function limits its suitability for casual pedestrians or cyclists, though planned upgrades under the National Transport Strategy may improve active travel options in the future.

N71

The N71 is a national primary road that connects Cork City to West Cork, starting at the Bandon Road Roundabout on the N40 South Ring Road and extending southward through areas like Bandon and Clonakilty. Within Cork City, it is a busy urban arterial road with significant vehicular traffic. Pedestrian infrastructure along the N71 in the city includes standard pavements, though their width and condition vary depending on the urban or suburban context. Near the Bandon Road Roundabout, pedestrian crossings exist to facilitate access to west Bishopstown, but these are primarily designed for vehicle-heavy junctions rather than prioritising foot traffic. Cycling infrastructure is limited, with no dedicated cycleways along the urban stretch of the N71. Cyclists typically share the road with vehicles, which can be intimidating due to the road's high traffic volumes and speeds, especially near major junctions like the Bandon Road Roundabout. The lack of segregated cycle lanes makes the N71 less attractive for cycling commuters, though its connectivity to the N40 and city centre makes it a potential candidate for future active travel upgrades under plans like BusConnects.

Bishopstown Road

Bishopstown Road is a key urban road in the Bishopstown area, connecting residential and commercial zones, including access to Munster Technological University (MTU) and Wilton Shopping Centre. It is a moderately busy road with a mix of

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residential, educational, and retail activity. Pedestrian infrastructure includes well-maintained pavements along most of its length, suitable for the area's high footfall, particularly near MTU and local schools. The pavements are generally wide enough to accommodate students and residents, though some older sections may be narrower. Cycling infrastructure has seen some development, with protected cycle lanes installed on parts of Bishopstown Road, particularly near its junction with Curraheen Road and Melbourn Road, as part of Cork City Council's active travel initiatives. These lanes connect to existing routes on Rossa Avenue and Melbourn Road, enhancing the area's cycle network. However, gaps remain, and some sections still require cyclists to share the carriageway with vehicles, which can be challenging during peak traffic times. The road's relatively flat terrain makes it more cycle-friendly than hilly areas like Sunday's Well, and plans under BusConnects aim to further integrate cycling infrastructure with high-frequency bus services, potentially improving connectivity to the wider Bishopstown area.

Curraheen Road

Curraheen Road is a significant urban road in the Bishopstown area, running parallel to the Curraheen River and connecting residential zones to local amenities like shops, schools, and healthcare services. It is a wide road with noted high vehicular speeds, often exceeding 50 km/h, which has raised safety concerns. Pedestrian infrastructure consists of standard pavements, with upgrades implemented in recent years, including new footpaths and crossings as part of the Curraheen Road Pedestrian and Cycle Safety Improvement Scheme. These improvements, completed around 2021, enhanced pedestrian access, particularly near Scoil an Spioraid Naoimh and Curraheen Church. Cycling infrastructure has also been expanded, with segregated cycle lanes installed along parts of the road, connecting to existing routes like the Curraheen Greenway, Rossa Avenue, and Melbourn Road. A partial inbound bus and cycle lane exists, but the outbound cycle lane was initially incomplete, prompting advocacy from the Cork Cycling Campaign for continuous segregated lanes. The scheme aims to create a cohesive cycle network, making Curraheen Road a spine for the Bishopstown and Curraheen communities. Despite these upgrades, concerns remain about vehicular speeds and the need for further segregation to enhance cyclist safety. The road's integration with the Curraheen Walk and Cycleway, a 4.4 km route upgraded in 2021, further boosts its active travel credentials, offering a scenic and safer option for pedestrians and cyclists alongside the river.

6.7.7 Future Sustainable Transport

The future of sustainable transport in the area is poised for significant enhancement through various initiatives outlined in the Cork Metropolitan Area Transport Strategy (CMATS) and other related programs. These initiatives aim to promote environmentally friendly transportation options, reduce traffic congestion, and improve overall accessibility for residents.

- CMATS Implementation: The Cork Metropolitan Area Transport Strategy emphasises the development of an integrated transport network that prioritises sustainable modes of travel. This includes expanding public transport services, enhancing walking and cycling infrastructure, and improving connectivity between different transport modes. The applicant's site will benefit from the broader goals of CMATS, which aims to reduce reliance on private cars and encourage public transport use.
- Public Transport Enhancements: Plans for improved public transport services include increased frequency and reliability of bus routes serving the wider area. The introduction of priority signalling at intersections will enhance the efficiency of public transport, making it a more attractive option for commuters.
- Active Travel Infrastructure: To support walking and cycling, initiatives will include the construction of new pedestrian and cycling paths, as well as the enhancement of existing routes. These upgrades aim to create a safer and more convenient environment for pedestrians and cyclists, encouraging active travel within the community.
- Electric Vehicle Charging Infrastructure: As part of the transition to sustainable transport, there will be an expansion of electric vehicle (EV) charging points throughout the City. This infrastructure will support the adoption of electric vehicles, contributing to reduced emissions and promoting greener transportation options.
- Mobility Management Programs: Local initiatives aimed at promoting sustainable transport behaviours, such as carpooling, public transport use, and active travel, will be implemented. These programs may include awareness campaigns and incentives to encourage residents to choose more sustainable travel options.

The CMATS strategy is supported within the Cork City Development Plan.

Notably, the new routes include the 2A service to MTU and Glanmire, operating every 15 minutes, and the 2B service to Grange Manor and Lotabeg, with a frequency of 30 minutes. This robust public transport network is essential for promoting accessibility and convenience for future residents.

The NTA launched a design for the Cork City Bus Network in June 2025 . The following high quality bus routes serve the proposed development and are shown below in Figure 6.1:

- Route 2A: MTU – Glanmire Hazlewood Centre (Frequency – 15minutes).
- Route 2B: Grange Manor – Lotabeg (Ashmount)

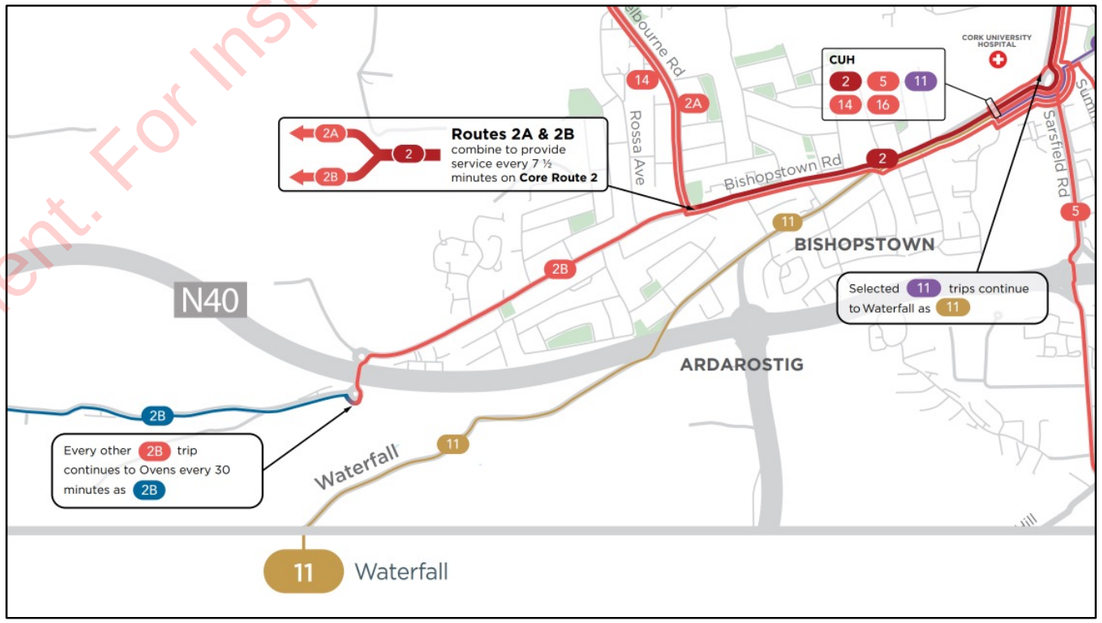


Figure 6.1 Bus services- (Bus Connects - NTA)

The Waterfall Road is being significantly enhanced and widened, with urban gateway features at either end of the development, which are compliant to DMURS. The footpath along the south of Waterfall Road is also to be extended to link from the N40 overbridge to the development site. Pedestrian crossings are also proposed at The Rise Estate and the Audi Garage in the Bishopstown direction which are to improve connectivity further.

The proposed LRD is to be accessed via Waterfall Heights and so will be integrated with the upgrades along Waterfall Road. Future pedestrian/cycle connectivity to the N71 from the eastern boundary of the site is also a possibility and would provide residents with a safe and sustainable means of travelling to local amenities (i.e. Dunnes Stores).

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6.7.8 Local Road Network

A brief description of the local road network near the proposed development is provided below.

N40 South Ring Road

The N40 South Ring Road is a dual carriageway serving as a major orbital route around the southern suburbs of Cork City, connecting the N22 west of Ballincollig to the Dunkettle Interchange via the Jack Lynch Tunnel under the River Lee. It facilitates high volumes of commuter and through traffic, bypassing the city centre. The road experiences significant congestion, particularly at key interchanges like the Kinsale Road Roundabout, Bandon Road Roundabout, and Dunkettle Interchange, especially during morning and evening peak periods. On-street parking is not permitted due to the road's high-speed design, but lay-bys and service areas exist at certain points. The N40 primarily serves vehicular traffic, with limited access for local properties, as it is designed for regional connectivity rather than local access. Traffic management measures, such as variable speed limits and planned upgrades under the National Transport Authority's strategies, aim to alleviate delays, but bottlenecks remain a challenge during peak hours.

N71

The N71 is a national primary road that begins at the Bandon Road Roundabout on the N40 South Ring Road, extending southwards from Cork City towards West Cork, serving areas like Bandon and Clonakilty. Within the city, it functions as a two-way single carriageway with moderate to high traffic volumes, acting as a key radial route linking southern suburbs to the city centre. The road experiences delays, particularly at the Bandon Road Roundabout during peak morning and evening periods, due to its role as a gateway to the N40 and other arterial routes. On-street parking is limited in the urban section, with some residential and commercial properties along the route generating parking demand, particularly near local businesses. The carriageway width varies, with narrower sections closer to the city centre constraining traffic flow during busy periods. The N71's role as a regional connector means it prioritises vehicular movement, though its urban stretch sees mixed use from local and through traffic.

Bishopstown Road

Bishopstown Road is a two-way single carriageway in the Bishopstown area, serving as a key radial route connecting residential, educational, and commercial zones, including Munster Technological University (MTU) and Wilton Shopping Centre, to the city centre via Western Road. The road experiences moderate traffic volumes, with congestion occurring during peak morning and evening periods, particularly near the junctions with Curraheen Road and Melbourn Road due to high commuter and student traffic. On-street parking is available along parts of the road, primarily serving residential properties, but parking demand increases near MTU and retail areas, impacting traffic flow on narrower sections. The road's urban setting and proximity to amenities make it a busy corridor, with traffic management measures like signalised crossings and recently added cycle lanes aiming to balance vehicular, pedestrian, and cyclist needs. Delays are common during school and university hours due to the road's role as a local access route.

Curraheen Road

Curraheen Road is a two-way single carriageway in the Bishopstown area, running parallel to the Curraheen River and connecting residential areas to local amenities such as schools, Curraheen Church, and healthcare facilities. It serves as a local access route with moderate traffic volumes, though high vehicular speeds (often exceeding 50 km/h) have been noted as a safety concern. Traffic delays occur during peak morning and evening periods, particularly at the junction with Bishopstown Road, driven by commuter and school-related traffic. On-street parking is available, primarily for residential properties, with additional demand near community facilities like Scoil an Spioraid Naoimh. The road's width supports recent infrastructure upgrades, including segregated cycle lanes and improved pedestrian crossings as part of the Curraheen Road Pedestrian and Cycle Safety Improvement Scheme, though narrow sections still pose challenges for traffic flow. Its role as a spine for the Bishopstown and Curraheen communities makes it a critical local route, with ongoing efforts to enhance active travel options.

6.7.9 Baseline Traffic Movements

Current traffic movements in the area are dominated by private vehicle use, with public transport and active travel modes accounting for a smaller proportion of journeys.

Traffic surveys were undertaken by a third-party traffic survey company, Irish Traffic Surveys, on Thursday March 21st, 2024. These 12-hour traffic counts allow for the assessment of existing traffic conditions on the local road network at the development entrance and adjacent main road junction, and the determination of morning and evening peak traffic (07:30-08:30 in the AM and 16:30-17:30 in the PM).

An additional traffic count was conducted on the Sarsfield Heights residential development (P.A. Ref: 17/4877) on November 21st, 2024, which is in relatively close proximity to the proposed development location. These counts were used to determined traffic generation rates for the proposed development due to the similarity in location and development profile.

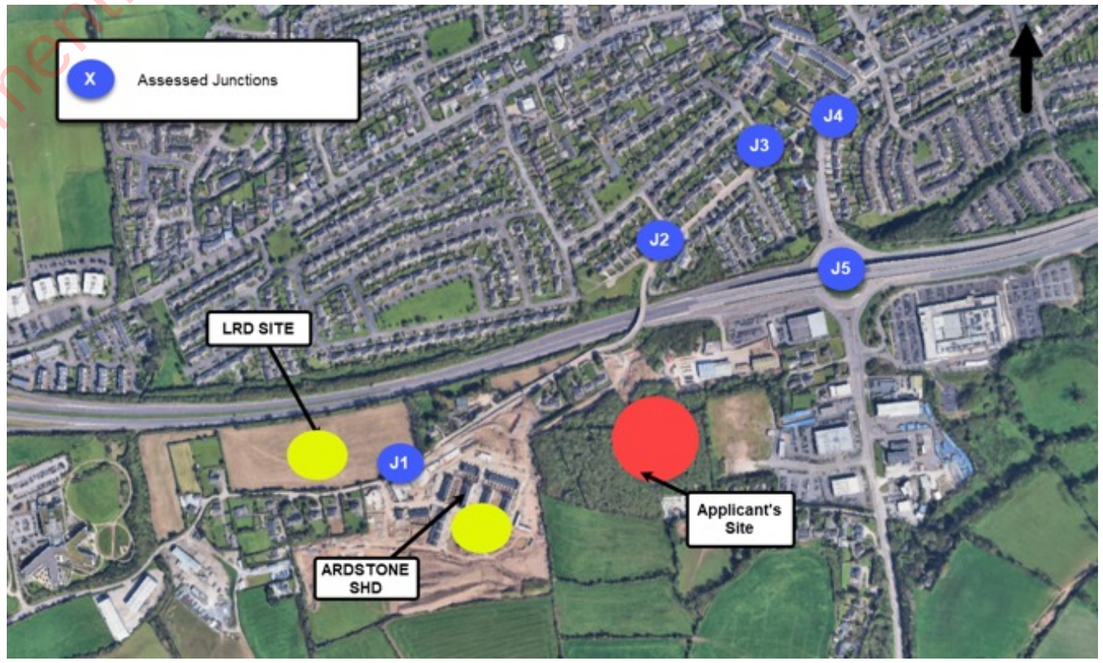


Figure 6.3 JTC Locations Source: Google Maps

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This TTA assessment focused on the following traffic junctions and are shown in Figure 6.3:

- The proposed development site Entrance onto Waterfall Road (J1)
- Waterfall Road / The Rise Estate Western Entrance (J2)
- Waterfall Road / The Rise Estate Eastern Entrance (J3)
- Waterfall Road/ Bandon Road Junction (J4)
- The Bandon Road Roundabout (J5).

Surveyed AM and PM peak hour traffic flows were converted into AADT using a factor calculated from the TII expansion factors. Vehicle flows across the study area were calculated for the links shown in Figure 6.4.

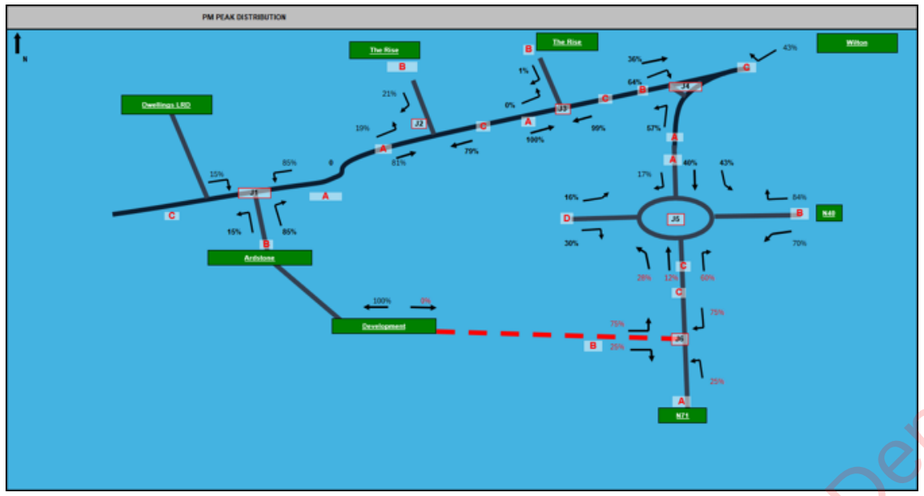


Figure 6.4 Links in the Study Area (PM peak flows)

Table 6.4 shows the calculated Base 2024 Average Annual Daily Traffic (AADT) for each of the links illustrated in Figure 6.4 and additionally highlights the links deemed sensitive to increases in traffic levels. This sensitivity assessment has been conducted by MHL, considering the presence of sensitive receptors (such as schools and community facilities) as well as the nature and purpose of the roads.

Table 6.4 Base Year AADT

Link Ref.	Description	Base 2024 AADT *(2way flow) estimated	Sensitive link (as per IEMA Guidelines)	IEMA Threshold for assessment	Note
1	Development Road	1569	Yes	0.1	Sensitive as passes through residential area
2	Waterfall Road J1 West	1928	Yes	0.1	Sensitive as passes through residential area
3	Waterfall Road J1-J2	6041	Yes	0.1	Sensitive as passes through residential area
4	Waterfall Road J2-J3	5772	Yes	0.1	Sensitive as passes through residential area
5	Waterfall Road J3-J4	5974	Yes	0.1	Sensitive as passes through residential area
6	Bishopstown Road J4 East	13809	Yes	0.1	Sensitive as passes through residential area
7	R849 J4-J5	14470	Yes	0.1	Sensitive as passes through residential area
8	N71 South J5-J6	24087	No	0.3	n/a
9	N40 West	24211	No	0.3	n/a
10	N40 East	23201	No	0.3	n/a

6.7.10 Road Safety

The Road Safety Authority traffic collision statistics for the surrounding road network are currently unavailable due to GDPR reasons. Historic statistics from the RSA note one serious collision on the Waterfall Road to the west of the proposed development between 2005 and 2016. A Road Safety Audit has been completed as part of this LRD application.

6.7.11 Future Infrastructural Improvement

The National Planning Framework and local development plans propose several infrastructural improvements, including enhanced cycling infrastructure and public transport upgrades, which are factored into the future scenario analysis.

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6.8 The 'Do Nothing' Scenario

If the proposed development were not to proceed, the baseline situation would remain unchanged, with current traffic patterns, transport infrastructure, and environmental impacts persisting. Evaluating the "do-nothing" scenario involves considering the likely consequences over both temporary (less than 1 year) and short-term (1-7 years) periods.

In the short-term, the absence of development could lead to impacts, such as:

- No additional construction-related traffic: This would avoid temporary increases in traffic congestion, noise, and air pollution typically associated with construction activities.
- Minimal disruption to local residents: With no construction occurring, local communities would experience fewer disruptions from road closures or altered traffic patterns.

If the development does not proceed, the current traffic conditions would likely remain unchanged in the short term, with gradual increases in traffic levels due to regional growth. Existing congestion points would persist. While avoiding the proposed development may result in fewer immediate disruptions, the long-term implications could include missed opportunities for improved transport infrastructure, sustainable travel options, and reduced traffic-related environmental impacts.

6.9 Characteristics of the Proposed Development

A description of the site is provided in 'Chapter 2 – Proposed Development'. The main features of the site design from a transport perspective are:

- Pedestrian and vehicular access into the site will be taken from an existing access from the nearby adjoining estate, which will form the main access into the site (post construction).
- A network of high-quality walking routes will be created within the subject site, and an extensive set of measures are in place to reduce vehicle speeds and priority. All proposed road and paths within the development will be designed in accordance with the Design Manual for Roads and Streets (DMURS, 2019) and the NTA's National Cycle Manual 2023.
- The development will alignment with CCC Development Planning for the area.

6.10 Potential Significant Effects

The proposed development will have direct and indirect traffic-related impacts during both the construction and operational phases. Direct effects include increased traffic volumes, noise, air pollution, and potential road safety risks due to construction vehicles and increased daily trips. Indirect effects involve potential disruptions to the local community's accessibility, impacts on public transport, and cumulative effects on traffic congestion when combined with other developments.

However, the project offers positive impacts, such as improved road infrastructure, enhanced pedestrian and cycling facilities, and alignment with sustainable transport initiatives like CMATS, which support long-term reductions in car dependency. Mitigation measures are expected to minimise negative effects to acceptable levels.

6.10.1 Site Set up Phase

During the site set up phase, there will be a temporary increase in traffic due to the movement of construction vehicles, including heavy goods vehicles (HGVs) transporting debris and materials to and from the site. This could lead to short-term congestion, particularly around access routes and local roads. These impacts are expected to be temporary, lasting only for the duration of these initial activities, and will be managed through the implementation of a Construction Traffic Management Plan (CTMP) to mitigate congestion and parking disruptions, with work parking to be provide on site for the duration of the works.

6.10.2 Construction Phase

The construction phase will generate additional traffic, particularly heavy goods vehicles (HGVs) and worker transport. Road closures and temporary diversions may be required, leading to moderate, short-term impacts.

6.10.2.1 Construction Programme

It is suggested that, upon approval of a successful application, the construction will occur in multiple phases. The dwelling units will be developed sequentially, beginning in the western section of the site and progressing systematically. Work on site is anticipated to commence in the first or second quarter of 2026, starting with site setup, followed by layout and service provision. The total construction duration for the proposed project is expected to be 24 months. While this timeframe may vary due to various factors, it is regarded as a reliable estimate based on the information available at the time of this report's preparation.

6.10.2.2 Site Operating Hours

The anticipated working hours on site are as follows:

- Monday to Friday: 7:00 – 19:00
- Saturday: 7:00 – 16:00

It is proposed that, in exceptional circumstances and with prior approval from the planning authority, working hours may be extended, and work may take place on Sundays and Bank Holidays if critical tasks need to be expedited. Extended working hours may be implemented during scheduled concrete pours. Any request for longer working hours will be coordinated in advance with the planning authority.

6.10.2.3 Vehicle Types

The following types of vehicles (estimated) will be utilised on site during the construction phase:

- Bowsers
- Breakers
- Containers
- Dozers
- Dumpers
- Excavators
- Generators
- Plate Compactors
- Power Washers
- Rollers

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6.10.3 Construction Traffic

Construction traffic will consist of vehicles used by construction workers (cars), LGV's and HGV's transporting construction materials. The peak period for HGV movements on site is expected to occur during early earthworks/ construction. During this time, there will be an estimated 20 HGV trips to the site (40 two-way movements). Additionally, it is anticipated that there may be up to 8 construction workers on site during peak periods of stage I (site set up), up to 8-50 construction workers on site during peak periods of stage II, (Setting Out of Sites And Provisions Of Services), and there may be up to 100 construction workers on site during peak periods of stage III (Construction Stage of Residential Units). Assuming a conservative occupancy of 2 workers per vehicle, this would result in up to 50 inbound and 50 outbound vehicle trips to the site each day. Travel for construction workers will generally take place outside of peak hours on the local road network, with most operatives arriving before 8:00 AM and departing after the evening peak.

The following table shows the predicted daily percentage impact on the road links on the proposed construction routes, conservatively assuming that all construction traffic travels on each road link.

Table 6.5 Construction Impact (with mitigation)

Ref	Road Link	DM 2027			Construction Traffic						Magnitude	
		HGV	CAR/ LV	Total	HGV	CAR/ LV	Total	CAR/ LV	HGV	Total	Car/LV	HGV
1	Development Road	0	1569	1569	0	15	15	1.0%	0.0%	1.0%	Negligible	Negligible
2	Waterfall Road J1 West	36	7238	7274	0	5	5	0.1%	0.0%	0.1%	Negligible	Negligible
3	Waterfall Road J1-J2	41	8242	8283	0	10	10	0.1%	0.0%	0.1%	Negligible	Negligible
4	Waterfall Road J2-J3	38	7550	7588	0	10	10	0.1%	0.0%	0.1%	Negligible	Negligible
5	Waterfall Road J3-J4	39	7807	7846	0	10	10	0.1%	0.0%	0.1%	Negligible	Negligible
6	Bishopstown Road J4 East	77	15268	15344	0	10	10	0.1%	0.0%	0.1%	Negligible	Negligible
7	R849 J4-J5	82	16238	16320	0	10	10	0.1%	0.0%	0.1%	Negligible	Negligible
8	N71 South J5-J6	133	26543	26676	0	10	10	0.0%	0.0%	0.0%	Negligible	Negligible
9	N40 West	1076	23135	24211	20	85	105	0.4%	1.9%	0.4%	Negligible	Negligible
10	N40 East	1048	22153	23201	20	85	105	0.4%	1.9%	0.5%	Negligible	Negligible

Table 6.5 shows that, in terms of overall traffic numbers, the biggest impact will be a 1.0% increase in traffic on link 1, however, within this figure there will be no increase in construction HGV flows as these HGV movements are to be routed through the site's construction access with the N40. A more detailed assessment of is provided below.

When the magnitude of effect is combined with the sensitivity of the receptor in accordance with Table 6.3, it can be concluded that there will be a short-term major / moderate effect during construction stage.

Table 6.6 Severance (without mitigation)

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Development Road	Medium	Major	Major/Moderate
2	Waterfall Road J1 West	Medium	Minor	Moderate/Minor
3	Waterfall Road J1-J2	Medium	Major	Major/Moderate
4	Waterfall Road J2-J3	Medium	Major	Major/Moderate
5	Waterfall Road J3-J4	Medium	Major	Major/Moderate
6	Bishopstown Road J4 East	Medium	Minor	Moderate/Minor
7	R849 J4-J5	Medium	Minor	Moderate/Minor
8	N71 South J5-J6	Medium	Negligible	Minor
9	N40 West	Low	Negligible	Negligible
10	N40 East	Low	Negligible	Negligible

The Construction Traffic Management Plan (CTMP) aims to mitigate the traffic impacts during the construction phase, particularly concerning Heavy Goods Vehicles (HGVs) in the area. Key measures include scheduling HGV deliveries outside peak traffic hours to reduce congestion, implementing on-site wheel washing facilities and road sweeping to minimise dust and debris transfer, and installing safety signage to warn road users of slow-moving construction traffic.

As a result of these proactive measures, the residual impact on local traffic is expected to be reduced. While there may still be some temporary disruptions due to construction activities, the planned interventions will effectively reduce significant adverse effects, ensuring the safe and efficient movement of traffic in the area. Overall, the CTMP is designed to maintain local road safety and accessibility throughout the construction phase.

Table 6.7 Severance (with mitigation)

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Development Road	Medium	Negligible	Minor
2	Waterfall Road J1 West	Medium	Negligible	Minor
3	Waterfall Road J1-J2	Medium	Negligible	Minor
4	Waterfall Road J2-J3	Medium	Negligible	Minor
5	Waterfall Road J3-J4	Medium	Negligible	Minor
6	Bishopstown Road J4 East	Medium	Negligible	Minor
7	R849 J4-J5	Medium	Negligible	Minor
8	N71 South J5-J6	Medium	Negligible	Minor
9	N40 West	Low	Negligible	Negligible
10	N40 East	Low	Negligible	Negligible

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6.10.4 Haulage Construction Routes

To minimise the impact on the local community, it is proposed to limit HGV deliveries to the most appropriate routes and route truck movements through a construction access with the N40, separating construction haulages flows from the adjoining residential estate. The proposed construction haulage access routes are shown in Figure 6.5 and will utilise Heiton Steel existing junction access.

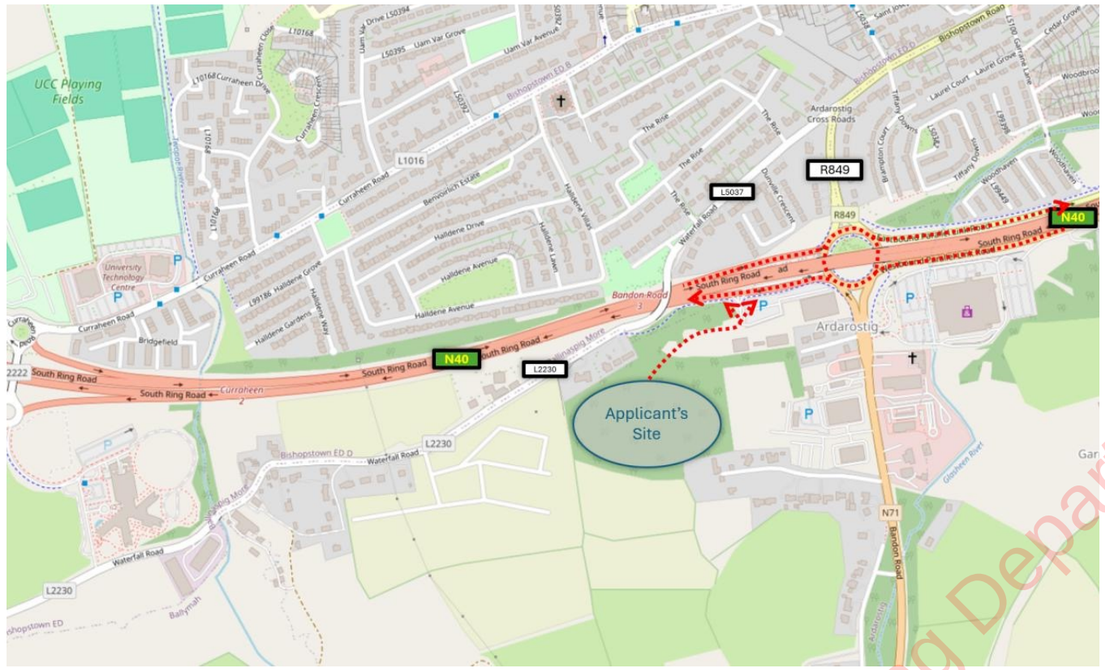


Table 6.8 shows that during the AM peak hours (08:00 – 09:00), the development is expected to generate a total of 188 vehicle trips. In the PM peak hour (17:00 – 18:00), 189 trips are expected to be generated.

6.12 Traffic Distribution

The new traffic demand generated by the development, has been allocated across the network based on the traffic distribution observed in the 2024 surveys. This methodology is discussed in submitted Traffic and Transportation Assessment (TTA).

6.12.1 Traffic Impact

Traffic flows have been calculated for the following scenarios:

- **Do Minimum 2027** (Year of Opening) (without scenario)
- **Do Something 2027** (Year of Opening) (with scenario)
- **Do Minimum 2032** (Year of Opening +5) (without scenario)
- **Do Something 2032** (Year of Opening +5) (with scenario)
- **Do Minimum 2042** (Year of Opening + 15) (without scenario)
- **Do Something 2042** (Year of Opening + 15) (with scenario)

Background traffic growth, along with traffic from committed developments, has been incorporated into the 2024 survey totals to establish the future year Do Minimum scenarios.

Traffic growth between 2024, 2027, and 2042 has been determined using trip-end totals from the **CMATS Regional Traffic Model**, which indicates the following growth factors within the Cork Metropolitan area:

- **2024-2027** – 5.2%
- **2024-2042** – 22%

These growth factors are considered robust, especially in light of the overarching goals of CMATS and the **Climate Action Plan 2025** which aim to reduce traffic levels over the same timeframe.

The increase in traffic resulting from applying this growth is viewed by MHL as a proxy for the traffic generated by developments in the Development Plan for the City.

The development contribution to the future year link flows on the wider local road network is shown in Table 6.9.

Table 6.9 AADT Link Flows & Development Contribution (post construction/operational)

Ref	Road Link	IEMA Threshold	DM 2027	DM 2027 with devt.	Increase**	%Impact
1	Development Road	10%	1569	3620	2051	131%
2	Waterfall Road J1 West	10%	7274	7577	303	4%
3	Waterfall Road J1-J2	10%	8283	10032	1749	21%
4	Waterfall Road J2-J3	10%	7588	8933	1345	18%
5	Waterfall Road J3-J4	10%	7846	9191	1345	17%
6	Bishopstown Road J4 East	10%	15344	15916	572	4%
7	R849 J4-J5	10%	16320	17082	762	5%
8	N71 South J5-J6	10%	26676	26788	112	0%
9	N40 West	n/a	24211	24331	120	0%
10	N40 East	n/a	23201	23321	120	1%

The figures above show that the predicted impacts of the development are below 10% on all links in the study area, with the exception of the section of Links 1,3,4 and 5.

A detailed assessment has been undertaken on this link and is presented below.

6.12.2 Severance

6.12.2.1 Description

Severance, as defined by the IEMA Guidelines, refers to the perceived division within a community when major traffic arteries separate neighbourhoods or areas. The potential for the proposed development to cause severance is evaluated individually, relying on professional judgment, particularly when traffic increases are anticipated on roads that pass through residential areas.

Increased severance can lead to the isolation of parts of a settlement or individual properties. This situation may arise from the challenges of crossing heavily trafficked roads or from physical barriers created by those roads themselves. The effects of severance can impact various groups, including residents, motorists, and pedestrians, making it crucial to assess and address these potential consequences during planning and development processes. Effective mitigation measures, such as improved pedestrian crossings, traffic calming features, and community engagement in design, are essential to minimise severance impacts and maintain community connectivity.

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6.12.2.2 Assessment

According to Table 6.1, the sensitivity of Link 1 to changes in traffic levels regarding severance is deemed medium.

By combining the negligible magnitude of effect with the medium sensitivity of the receptor as outlined in Table 6.3, it can be concluded that there will be a long-term, negligible severance effect. This effect is classified as Minor under the EIA regulations, indicating that the proposed development is not expected to have a meaningful impact on community connectivity in this area in the long term (post construction).

Table 6.10 Severance

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Development Road	Medium	Negligible	Minor
3	Waterfall Road J1-J2	Medium	Negligible	Minor
4	Waterfall Road J2-J3	Medium	Negligible	Minor
5	Waterfall Road J3-J4	Medium	Negligible	Minor

6.12.3 Driver Delay

6.12.3.1 Description

The IEMA Guidelines indicate that delays are considered significant primarily when traffic on the surrounding network is already at or near its capacity. This means that if the existing road system is functioning close to its maximum capacity, any additional traffic introduced by a new development could exacerbate congestion, leading to notable delays. Therefore, the potential for significant delays is closely tied to the current levels of traffic and the overall capacity of the transportation infrastructure in the vicinity of the proposed development.

6.12.3.2 Assessment

Additional delay to non-development traffic may occur at several points on the road network in the vicinity of the subject site, including:

- At the Site access junction, where there will be additional turning movements, and new delay to traffic on Waterfall Road.
- At the Waterfall Road/ Bandon Road junction, through which the majority of development traffic will pass.

The sensitivity of link 1 to an increased driver delay effect is considered to be medium in accordance with Table 6.1.

With reference to Table 6.2, the magnitude of change in total traffic on Link 1 is considered to be major as the increase is over 90%. Combining the major magnitude of the change with the medium sensitivity of the receptor in accordance with Table 6.3 equates to an effect which is classed as long-term, major / moderate as per the EIA Regulations.

With reference to Table 6.2, the magnitude of change in total traffic on Link 3 ,4 and 5 is considered to be minor as the increase in both is between 10% and 40%. Combining the minor magnitude of the change with the medium sensitivity of the receptor in accordance with Table 6.3 equates to an effect which is classed as long-term, moderate / minor as per the EIA Regulations.

The EIAR assessment is a link assessment that differs from the junction capacity assessment that has been undertaken in the TTA.

The results show that with the addition of traffic from the development, the development arm of the junction is predicted to operate within practical capacity in 2027. The TTA concludes that this level of predicted short-lived congestion is not unusual in an urban setting during the peak hour, and is acceptable, particularly when the robust approach to trip generation that has been adopted is considered.

Table 6.11 Driver Delay

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Development Road	Medium	Major	Major / Moderate
3	Waterfall Road J1-J2	Medium	Minor	Moderate/ Minor
4	Waterfall Road J2-J3	Medium	Minor	Moderate/ Minor
5	Waterfall Road J3-J4	Medium	Minor	Moderate/ Minor

6.12.3.3 Description

Traffic volume, composition, speed, and the presence (or lack of) pedestrian footways and crossings all contribute to the level of general pleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

6.12.3.4 Assessment

The sensitivity of increased pedestrian delay and amenity is considered to be medium in accordance with Table 6.1. With reference to Table 6.2, the magnitude of change in total traffic on Link 1 is considered to be minor. Combining the minor magnitude of the effect with the medium sensitivity of the location in accordance with the matrix in Table 6.3, it is considered that increased traffic associated with the proposed development will have a long-term, moderate / minor effect on pedestrian delay and amenity. This effect is assessed as Not Significant in accordance with the EIA Regulations.

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Table 6.12 Pedestrian Delay and Amenity

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Development Road	Medium	Minor	Moderate/ Minor
3	Waterfall Road J1-J2	Medium	Minor	Moderate/ Minor
4	Waterfall Road J2-J3	Medium	Minor	Moderate/ Minor
5	Waterfall Road J3-J4	Medium	Minor	Moderate/ Minor

6.12.4 Cumulative Effects

Cumulative impacts have been assessed in conjunction with other planned developments in the area, considering overall growth in traffic demand. These impacts are expected to be moderate to significant, particularly during peak periods.

6.12.4.1 Summary

The key impacts across all phases will be increased traffic volumes, with potential effects on road safety, public transport capacity, and local congestion.

The following table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 6.13 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Increased traffic congestion	Adverse	Major	Local	Likely	Short-term	Direct
Noise from construction activities	Adverse	Major	Local	Likely	Temporary	Direct
Dust and air quality deterioration	Adverse	Moderate	Local	Likely	Temporary	Direct
Disruption to pedestrian access	Adverse	Minor	Local	Possible	Temporary	Direct
Risk of accidents due to increased HGVs	Adverse	Major	Local	Possible	Short-term	Direct

The following table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 6.14 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Increased traffic volume	Adverse	Moderate	Regional	Likely	Long-term	Direct
Air quality impacts from vehicle emissions	Adverse	Moderate	Local	Likely	Long-term	Direct
Noise pollution from increased traffic	Adverse	Moderate	Local	Likely	Long-term	Direct
Effects on local community amenity	Adverse	Minor	Local	Possible	Long-term	Indirect
Increased risk of accidents due to higher traffic levels	Adverse	Moderate	Local	Likely	Long-term	Direct

6.13 Accidents and Safety

6.13.1.1 Description

A high-level calculation has been undertaken to quantify the increased level of accident risk that could be expected due to an increase in traffic associated with the proposed development.

The likelihood of an accident occurring is commonly expressed in terms of ‘accidents per million vehicle- km’. Accidents that are appraised in relation to transport are those in which personal injury is sustained by those involved (personal injury accidents (PIAs)).

6.13.1.2 Assessment

The development site junction connects with Waterfall Road, with the primary operational traffic routing expected to flow east towards the Waterfall Road/ R849 junction (circa 1km). The can be classified as ‘urban typical single carriageway’ in accordance with the criteria set out within DMRB. Accident rates from the DMRB for this standard of road are:

- Urban typical single carriageway: 0. 844 PIA per million vehicle km.

In addition, a Stage 1 Road Safety Audit has been carried out at the Waterfall Road access junction, and corresponding footpath proposals at this location. The RSA considers vehicle, pedestrian and cyclist safety, as well as the safety of other vulnerable road users. This has ensured that the proposed designs provide suitable and safe infrastructure for all users.

Receptor sensitivity for Accident and Safety effects is always considered as high. The assessed magnitude of this effect is negligible. When combined, the effect can be classified as long-term, Minor and Not Significant.

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Table 6.15 Accidents and Safety (with mitigation)

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Development Road	High	Negligible	Minor
3	Waterfall Road J1-J2	Medium	Negligible	Minor
4	Waterfall Road J2-J3	Medium	Negligible	Minor
5	Waterfall Road J3-J4	Medium	Negligible	Minor

6.13.1.3 Screening conclusion

In conclusion, all of the impacts of the scheme have been assessed as minor (not significant) in accordance with the EIA Regulations.

6.14 Residual Impact Assessment

This section evaluates the potential significant environmental impacts that may persist after mitigation measures have been applied. Direct effects could include residual traffic increases, such as minor congestion during peak periods, localised noise, and air quality impacts from operational traffic. While these impacts are expected to be minimal, they may still affect nearby residents and local ecosystems, even after the mitigation measures are in place.

Indirect effects might involve long-term changes in traffic patterns, potentially influencing public transport efficiency and accessibility, as well as altering community mobility behaviour. The cumulative impact of increased traffic, when combined with other nearby developments, may contribute to a slight, residual pressure on local infrastructure. However, with mitigation strategies such as improved road design and sustainable transport options, these impacts are expected to remain within acceptable limits, ensuring that the overall environmental impact is minimal.

6.14.1 Construction setup up

After mitigation, residual impacts during the construction set up phase are expected to be minor and short-term.

6.14.2 Construction Phase

Residual impacts during construction are predicted to be moderate but temporary, mainly due to the influx of construction traffic.

6.14.3 Operational Phase

Residual impacts during the operational phase, after mitigation, are expected to be minor to moderate, with the greatest impacts during peak travel times.

6.15 Mitigation Measures

6.15.1 Incorporated Design Mitigation

The design incorporates enhanced pedestrian crossings, and traffic calming measures in line with DMURS (2019).

6.15.2 Construction Phase Mitigation

During construction, mitigation measures will include a construction traffic management plan, optimised routing of HGVs, and temporary parking solutions for construction workers.

Traffic impacts during the construction phase will be minimised through the implementation of a Construction Traffic Management Plan (CTMP), which will be agreed upon with CCC. A Framework CTMP, outlining the key principles to be followed, is included as part of the application package.

The following measures will help minimise the impact of HGV traffic on the adjoining road network:

- Scheduled Deliveries: HGV deliveries will be planned, as much as possible, outside of peak traffic periods, which have been identified as 08:00 – 09:00 and 16:30 – 17:30.
- Dust and Debris Control: Wheel washing facilities will be provided on site to reduce the transfer of dust and debris onto local roads. Additionally, a road sweeper will be deployed as needed to ensure the local road network remains clear.
- Warning Signage: Signs will be placed along adjoining haulage routes to alert all road users and local residents of the presence of slow-moving and turning HGV traffic. Further warning signs will be installed ahead of the Site Access junction to notify drivers approaching from both directions.

6.15.3 Operational Phase Mitigation

A Mobility Management Plan has also been developed by MHL and supplements the Traffic and Transportation Assessment submitted as part of the planning application. This plan serves as a 'best practice' measure to accompany the application. The purpose of the Mobility Management Plan is to reduce the percentage of single-occupancy vehicle trips and address the anticipated transport impacts on the end-users of the site. These mobility measures will also support residents who may choose to live 'car-free' by providing a range of sustainable transportation options, thus eliminating the need for car ownership. The measures primarily focus on promoting walking, cycling, and public transport use and can be broadly categorised into the following groups:

- Appointing a Mobility Manager.
- Providing a Welcome Travel Pack for residents.
- Implementing measures to encourage walking, such as clear signage and maps throughout the site.
- Implementing measures to promote cycling, including bike hire hubs on site and cycling signage and maps that indicate travel times to key destinations.
- Encouraging public transport use by collaborating with local bus operators to improve bus scheduling, routes, and school travel options.

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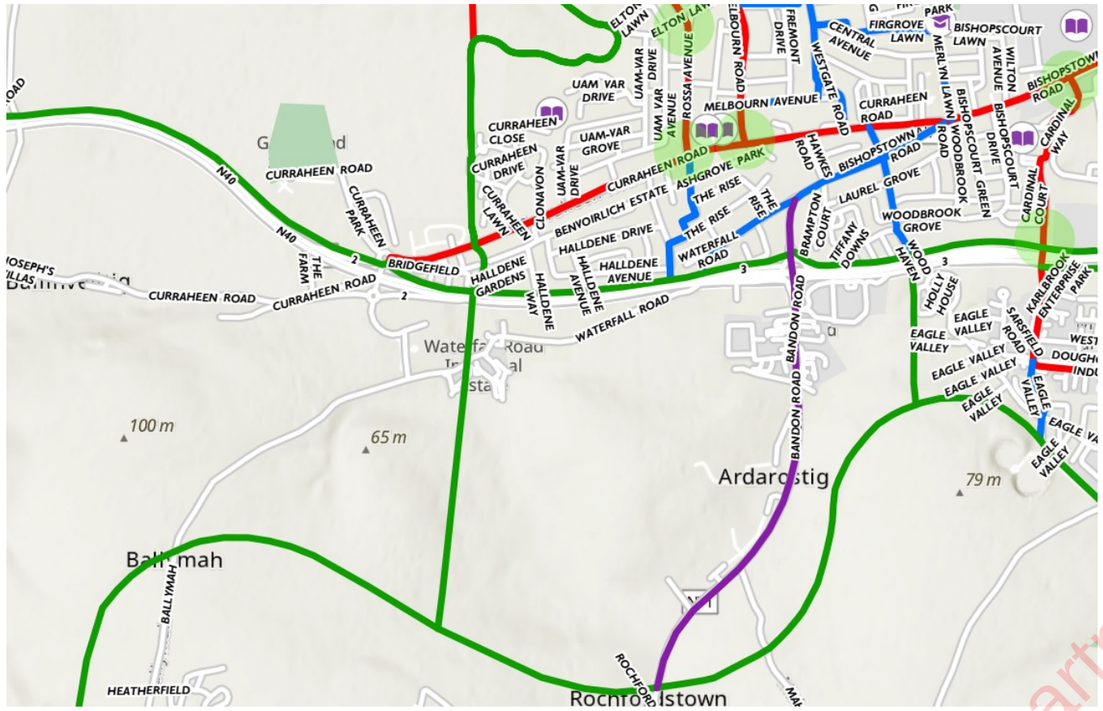


Figure 6.6 Proposed Cork Cycle Network Plan in Vicinity of Proposed Development (Source: Cork Cycle Network Plan)

The development will be designed to complement and support future transport initiatives such as these proposed cycle routes, which will provide cyclists with a safer and more efficient means of connectivity and wider further connectivity.

6.16 Summary of Post-mitigation Effects

With mitigation in place, most impacts are reduced to acceptable levels, with no significant long-term adverse effects anticipated.

The following table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

- Quality: Indicates whether the effect is neutral, positive, or negative.
- Significance: Represents the overall importance of the effect post-mitigation.
- Extent: Specifies the geographical area affected.
- Probability: The likelihood of the effect occurring.
- Duration: Refers to how long the effect is expected to last.
- Type: Indicates whether the effect is direct or indirect. (Direct effects are immediate, measurable impacts resulting directly from a project's activities, while indirect effects stem from secondary consequences that can develop over time.)

Table 6.16 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Reduced traffic congestion	Neutral	Minor	Local	Likely	Temporary	Direct
Noise reduction due to noise barriers	Neutral	Minor	Local	Likely	Temporary	Direct
Dust control measures effectively implemented	Neutral	Minor	Local	Likely	Temporary	Direct
Maintained pedestrian access	Positive	Minor	Local	Highly Likely	Temporary	Direct
Improved safety through traffic management measures	Positive	Moderate	Local	Likely	Temporary	Direct

The following table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 6.17 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Improved traffic flow due to road upgrades	Positive	Moderate	Local	Likely	Long-term	Direct
Reduced air quality impacts from enhanced traffic management	Positive	Moderate	Local	Likely	Long-term	Direct
Noise levels maintained within acceptable limits	Positive	Minor	Local	Likely	Long-term	Direct
Enhanced pedestrian safety through improved crossings	Positive	Moderate	Local	Highly Likely	Long-term	Direct
No significant increase in accident rates	Positive	Major	Local	Very Unlikely	Long-term	Direct

6.16.1 Cumulative Residual Effects

Cumulative effects from the development and other local projects are expected to be minor to moderate after the proposed mitigation measures are implemented.

Residual impacts are defined as the effects that are expected to persist after all assessments and mitigation measures have been implemented. These impacts represent the remaining "environmental costs" of a project, reflecting the final or intended effects of a development once mitigation efforts have been applied to minimise or eliminate adverse impacts. The potential residual impacts from the Proposed Development have been taken into account in this environmental assessment.

With the implementation of the Outline Construction Traffic Management Plan (OCTMP) and the Mobility Management Plan reporting, the residual impact of the Proposed Development is assessed as "not significant" when considering the development in isolation. Additionally, the proposed Active Travel improvements for the wider area will ensure that the cumulative effects of the development also result in a "not significant" residual impact.

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Figure 6.7 Potential construction build out phasing

Estimated development construction build out sequencing:

Construction Stage 1

- Establishing construction access / haulage routes onto the N40.
- Delivery of residential dwellings.
- Development of the section of the internal access road, serving as the spine road for future estate connection roadways.
- Establishment of a site compound and material enclosure.

Construction Stage 2

- Extension of the internal access road into the development.
- Construction of residential units on residentially zoned lands.

Construction Stage 3

- Construction of residential units on residentially zoned lands.

The cumulative assessment takes into account how development might proceed in the vicinity of the site in future years. It assumes the following:

- Construction of sub phasing/ delivery of yearly unit quantum
- An access junction onto the neighbouring estate, which provides the primary local access into the site. The access junction would be delivered in phase 1 , with internal linkages built out as subsequent construction sub phases are built out.
- In terms of the initial threshold assessment, the cumulative assessment assumes that the above would be in place from 2042 onwards.

6.17 Risk of Major Accidents or Disasters

The project has been carefully assessed for potential risks of major accidents, with particular attention to its vulnerability to such events. While the nature of the development introduces certain risks, the implementation of comprehensive road upgrades, rigorous safe working practices, and robust mitigation measures significantly minimises these risks. Enhanced infrastructure will improve traffic flow and reduce the likelihood of accidents, while stringent safety protocols during construction will protect workers and the surrounding community. Furthermore, the incorporation of emergency response plans ensures preparedness for any unforeseen incidents. As a result, the expected significant adverse effects on the environment from potential accidents or disasters are greatly mitigated, reinforcing the project's commitment to maintaining a safe and sustainable development environment.

The risk of major accidents or disasters related to transport, such as hazardous material spills, is low given the nature of the development. Emergency response plans will be in place and are to be agreed between the appointed contractor and the local authority.

6.18 Worst Case Scenario

The worst-case scenario would involve delays in public transport and road infrastructure upgrades, which could lead to more severe congestion and greater reliance on private car use.

6.19 Interactions

The Traffic and Transport Assessment (TTA) is linked to several other components of the Environmental Impact Assessment Report (EIAR), including sections focused on noise, air quality, and land use planning. This interconnectedness stems from the significant relationship between traffic volumes and their potential environmental consequences. For example, an increase in traffic can lead to heightened noise levels, which may adversely affect local residents and wildlife. Additionally, greater traffic volumes can result in worsened air quality due to higher emissions, posing risks to public health and the environment. Traffic patterns also play a crucial role in land use planning, as new developments can change existing traffic flows, which in turn impacts infrastructure needs and access considerations. By taking these interrelated aspects into account, the EIAR facilitates a thorough evaluation of the overall effects of the proposed development on both the environment and the well-being of the community. Please consult the relevant chapter of the Environmental Impact Assessment Report (EIAR) for additional details and information regarding the development assessment and subsequent findings.

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6.20 Monitoring

Traffic conditions will be monitored post-construction to ensure that mitigation measures are effective, with adjustments made as needed in collaboration with local authorities.

6.21 Summary of Mitigation and Monitoring

A comprehensive set of mitigation and monitoring measures has been proposed to minimise the development's impact on traffic and transport, focusing on all phases of the project.

The following table summarises the construction phase mitigation and monitoring measures.

Table 6.18 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Increased Traffic Congestion	- Schedule construction traffic outside peak hours.	- Regular monitoring of traffic flow and congestion levels.
Noise Pollution	- Implement noise barriers and limit construction hours.	- Conduct noise level assessments at sensitive receptors.
Dust and Air Quality Degradation	- Employ dust suppression techniques (e.g., water spraying).	- Monitor air quality at nearby residential areas.
Disruption to Pedestrian Access	- Establish clear signage and detours for pedestrians.	- Conduct regular checks to ensure pedestrian routes are safe.

The following table summarises the Operational Phase mitigation and monitoring measures.

Table 6.19 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Increased Traffic Volume	- Implement a Mobility Management Plan to promote sustainable transport options.	- Monitor traffic volumes and patterns post-implementation.
Improved Public Transport Access	- Enhance public transport services and facilities (e.g., bus stops, shelters).	- Survey public transport usage and satisfaction regularly.
Pedestrian and Cyclist Safety	- Install pedestrian crossings, bike lanes, and safety signage.	- Conduct regular safety audits and monitor accident reports.
Reduced Air Quality Issues	- Encourage use of electric vehicles and provide EV charging stations.	- Monitor air quality at key locations near the development.
Noise Levels Near Sensitive Areas	- Implement noise-reduction measures (e.g., sound barriers, landscaping).	- Regularly measure noise levels near sensitive receptors.

6.22 Conclusion

The assessment has found that there will no significant negative impact in terms of Traffic and Transportation post construction. The proposed development will have some traffic and transport impacts, but with effective mitigation measures in place inclusive of the development works as proposed, these traffic related impacts are not expected to be significant in the long term.

Implementing appropriate mitigation measures during the construction stage, such as establishing a separate construction access, is noted for minimising environmental impacts, as highlighted in this EIAR Traffic Chapter. This approach reduces disruption to local traffic, enhances safety, and reduces the impact of construction activities.

From a traffic perspective, it is evident that the development aligns with national and regional transport policies, as it effectively integrates into the existing urban extents. This alignment supports the objectives of enhancing connectivity, promoting sustainable transport options, and facilitating efficient movement within the area. By ensuring that the development complements the current transport infrastructure, it contributes to a cohesive urban environment that meets the needs of existing and prospective residents, as well as the wider public.

6.23 References and Sources

- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Institute of Environmental Management and Assessment (IEMA) Guideline: 'Environmental Assessment of Traffic and Movement (IEMA, 2023).
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- National Cycle Manual (NTA, 2023).
- National Transport Authority (2014). Traffic Management Guidelines. Available at: https://www.nationaltransport.ie/
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CHAPTER SEVEN

MATERIAL ASSETS: BUILT SERVICES

Cork City Council Draft Development Plan Consultation Purposes Only!

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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CHAPTER SEVEN

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CHAPTER 7 | Material Assets: Built Services

7.1 Introduction

Material assets are resources that are valued and intrinsic to the site of the proposed development and the surrounding area. These may be of either natural or human origin and the value may arise for economic or cultural reasons. This chapter considers and assesses the effects of the proposed development on the material assets, including the existing major utilities within and around the site, during the construction and operational phases.

In relation to material assets, the EPA (2022) Guidelines on the information to be contained in the Environmental Impact Assessment Reports states that:

"In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils."

In this instance 'built services' is taken to mean surface water drainage, foul water drainage, water supply and utilities (electricity, gas and telecommunications) infrastructure in the receiving environment. Traffic-related impacts have been addressed under the scope of Chapter 6 (Material Assets: Traffic & Transport). Water quality and other hydrological / hydrogeological impacts of the proposed development have been assessed under the scope of Chapter 10 (Water & Hydrology).

7.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Ben Mong CEng MIEI, Senior Civil Engineer at OSL Butler Consulting Engineers.

Ben Mong holds a Bachelor of Engineering Degree and is a Chartered Engineer with Engineers Ireland with 15 years' experience in planning, designing and directing the construction of developments in Ireland and South Africa, including large-scale residential development projects and EIAR's.

Ben Mong has carried out Material Assets: Built Services assessments and been involved in the preparation of EIARs for the following projects:

- Hacketstown Strategic Housing Development, Skerries, County Dublin
- Murphystown Way Large-scale Residential Development, Dublin 18, County Dublin
- Ballygossan Park Large-scale Residential Development, Skerries, County Dublin
- Mountain Road Large-scale Residential Development, Kilmoney, Carrigaline, County Cork

7.3 Proposed Development

A full development description can be found in Chapter 2 of this EIAR.

To summarise, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the construction of 246 no. residential units, 1 no. creche and all associated ancillary development works at Ardarostig, Bishopstown, Cork, Cork.

7.3.1 Aspects Relevant to this Chapter

7.3.1.1 Surface Water Drainage

It is proposed to service the proposed development by means of a connection to an existing surface water manhole which outfalls to an open drainage ditch.

The existing surface water system crosses the N40 and eventually discharges into the existing Glasheen River.

The proposed development has been sub-divided into smaller sub-catchments. These sub-catchments attenuate and control the discharge generated within to 2lts/sec/ha. Surface water run-off from the proposed development will be discharged, after attenuation and control, to 2lts/sec/ha.

The site's surface water management infrastructure has been designed in accordance with the Greater Dublin Strategic Drainage Study 2005 (GDSDS).

Proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study 2005 (GDSDS), Greater Dublin Regional Code of Practice (V6), the Department of the Environment's "Recommendations for Site Development Works for Housing Areas" (1998), the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal" and BS EN 752: 2008 "Drain and Sewer Systems Outside Buildings".

Sustainable drainage systems (SuDS) features incorporated in the design include green roofs, tree pits, swales, ponds, percolation areas, petrol interceptors and flow control devices in accordance with CIRIA publication C753 SuDS Manual. These design features will aid in managing rainwater close to where it falls, allow rainwater to soak into the ground, promote evapotranspiration, slow down and store runoff, treat runoff to reduce contamination through pollution prevention and controlling the runoff at source and reduce the risk of urban contaminants causing environmental pollution.

The proposed surface water drainage design has been discussed in more detail within the Engineering Services Report submitted as part of this application, under separate cover.

7.3.1.2 Wastewater Drainage

It is proposed that this development will be serviced internally by 150mm and 225mm diameter foul sewers and will include the provision of services connections, inspection chambers etc. throughout the site.

As part of the Uisce Éireann confirmation of feasibility received under CDS24008665, an upgrade is required to the existing foul sewer network to accommodate the proposed site. The aforementioned upgrade works include Sewer Network Upgrades downstream of the proposed development in order to facilitate this development. An upgrade of approx. 160 meters of existing Sewer network to 200mm would need to be facilitated, with this upgrade to be funded by the developer. These details to be confirmed by further studies.

Foul sewers have been designed and will be constructed in accordance with the Uisce Éireann 'Standard Details for Wastewater infrastructure' and 'Code of Practice for Wastewater Infrastructure'. In addition, foul sewers have been designed to the Building Regulations 1997, as amended, (referred to within as 'the Building Regulations') and specifically in accordance with the principles and methods set out in EN 752:2008 and DOE 'Recommendations for Site Development Works' (1998). In addition, HR Wallingford 'Tables for the Hydraulic Design of Pipes, Sewers and Channels' and Water UK/WRc 'Sewers for Adoption – 6th Edition' have been applied.

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7.3.1.3 Water Supply

It is proposed that this development will be serviced by 150mm and 100mm diameter watermains and will include the provision of new fire hydrants and relevant infrastructure throughout the site.

As part of the UE confirmation of feasibility received under CDS24008665, an upgrade is required to the existing water network to accommodate the proposed site. The aforementioned upgrade works include for part of the Uisce Éireann water network will have to be upgraded from 150mm to 200mm for approximately 200m. As Uisce Éireann currently do not have any plans to upgrade its network in this area. These works will be carried out by Uisce Éireann and the costs for this will be included in the connection fee.

All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Uisce Éireann 'Standard Details for Water Infrastructure' and 'Code of Practice for Water Infrastructure' and the Department of the Environment's Building Regulations "Technical Guidance Document B - Fire Safety (2020)".

7.3.1.4 Electrical Supply

In order to facilitate the new development the proposal is to install new electrical services to serve the houses and apartments. This involves the following:

- Rerouting the overhead lines underground.
- New Unit Substations.
- New underground ducting and electrical infrastructure to serve the development.
- New underground ducting and electrical infrastructure to serve the development lighting.

7.3.1.5 Gas Supply

It is not proposed that gas is provided to the houses and apartments in the development.

7.3.1.6 Telecommunications

In order to facilitate the new development, the proposal is to install new underground ducting and telecommunications infrastructure to serve the houses and apartments.

7.4 Methodology

As part of assessing the likely impact of the proposed development, surface water runoff, foul drainage discharge and water usage calculations were carried out in accordance with the relevant legislation and guidelines as set out below.

7.4.1 Relevant Legislation & Guidance

- Greater Dublin Strategic Drainage Study 2005 (GDSDS)
- Uisce Éireann Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03, July 2020, Revision 2)
- Uisce Éireann Code of Practice for Water Infrastructure (IS-CDS-5020-03, July 2020, Revision 2)
- Guidelines on the Information to be Contained In Environmental Impact Assessment Reports (May 2022) published by the EPA
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU, 2017) published by the European Commission

7.4.2 Site Surveys/Investigations

Assessment of the potential impacts of the proposed development on existing material assets in the vicinity of the site included:

- Review of Uisce Éireann utility plans (surface water drainage, foul drainage and water supply).
- Consultation with Uisce Éireann, Geological Survey Ireland, Inland Fisheries Ireland, OPW and Cork City Council.
- Submission of a Pre-Connection Enquiry Application to Uisce Éireann.
- Submission of proposed designs to Uisce Éireann for Design Vetting Assessment.
- Review of ESB Networks Utility Plans.
- Review of Gas Networks Ireland Service Plans.
- Review of Eir E-Maps.
- Review of Virgin Media Maps.
- Site Investigation Desk Study by IGSL (25-20387-1, July 2025)

7.4.3 Consultation

As part of the design development and planning application processes, consultations have been held with Uisce Éireann, Geological Survey Ireland, Inland Fisheries Ireland, OPW and Cork City Council in relation to Material Assets – Built Services.

A pre-connection enquiry was submitted to Uisce Éireann in relation to the water and wastewater strategy for the proposed development. A confirmation of feasibility (COF) letter was received from Uisce Éireann in April 2025, stating the following:

'Water Connection: Feasible Subject to upgrades

In order to complete the proposed connection at the Premises, the Uisce Éireann water network will have to be upgraded from 150mm to 200mm for approximately 200m. Uisce Éireann currently does not have any plans to upgrade its network in this area. These works will be carried out by Uisce Éireann and the costs for this will be included in your connection fee. Please see www.water.ie/connections/ for information on connection charges.

Connection point is proposed to be from a neighbouring development, a spine of 150mm is required through this development.

From a desktop survey, a PRV is recommended in the development, since the area will be between 30 and 50m. Head from the network will be 70m'

'Wastewater Connection: Feasible Subject to upgrades

Sewer Network Upgrades are required downstream of the proposed development in order to facilitate this development. An upgrade of approx. 160 meters of existing Sewer network to 200mm would need to be facilitated, with this upgrade to be

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funded by the developer. These details to be confirmed by further studies. Please Contact Uisce Éireann for further information. PWSA.'

The proposed water and wastewater drainage scheme for the development has been submitted to Uisce Éireann for Design Acceptance (Reference No. CDS24008665).

Preliminary discussions have been held with Area Engineers for both ESB & EIR to confirm adequate capacity is available in relation to this development.

7.5 Difficulties Encountered

No major or particular difficulties were encountered in preparation of this chapter.

7.6 Baseline Environment

Surface Water Drainage

Context and Character:

The site of the proposed development is greenfield in nature in respect of surface water drainage. The existing lands currently drains in a southernly direction towards an existing open drainage ditch located along the northern site boundary. The existing surface water system crosses the N40 and eventually discharges into the existing Glasheen River.

The location of this existing surface water drainage is shown on the OPW Drainage Maps (refer to Figure 7-1 below) as well as within the relevant civil engineering layouts submitted as part of this application, separately.

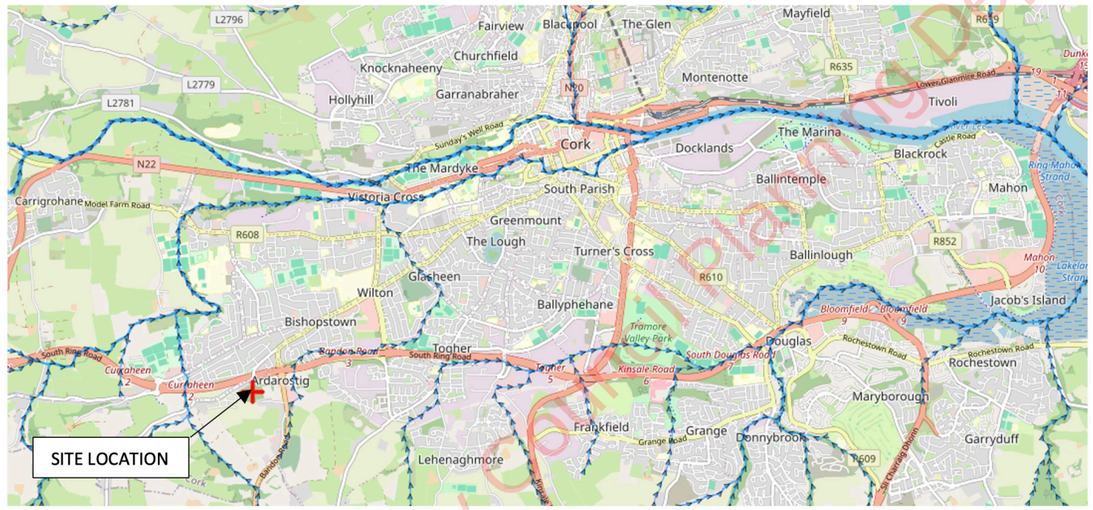


Figure 7.1 Extract from OPW Drainage Maps

Sensitivity:

Surface water drainage systems generally can be sensitive to changes in their design, installation, and maintenance. Factors that can affect the sensitivity of surface water drainage systems include:

- Changes in land use, such as urbanisation, can increase the number of impervious surfaces, such as roads and buildings, which can lead to increased stormwater runoff and reduced infiltration into the soil.
- The type of soil in a particular area can affect the ability of a drainage system to manage stormwater runoff effectively. For example, soils with high clay content may have a low infiltration capacity and can cause waterlogging and flooding.
- Proper maintenance of drainage systems, such as regular cleaning of catch basins and culverts, is essential to ensure their functionality and prevent clogging and blockages.
- Human errors and accidents such as excavation or equipment failure can cause damage to the system. Misconnection of wastewater drainage pipework can cause wastewater to enter the surface water drainage system.
- Climate change may cause changes in precipitation patterns and increased frequency of extreme weather events which can impact the sensitivity of surface water drainage systems.

Overall, surface water drainage systems are Moderately Sensitive to changes. The River Waterbody Glasheen (Cork City) EPA Code 19G04, and Transitional Waterbodies, Lee (Cork) Estuary Upper and Lower, approximately 4.5km to the northeast of the subject lands is a receiving environment for surface water runoff from the site and is potentially Significantly Sensitive to changes in the nature of surface water runoff from the site.

A flood risk assessment of the site has been performed by OSL Butler Consulting Engineers and included as part of this application under sperate cover. The assessment concludes that the risk of flooding at the site is not significant and that the development of the site will not result in a significant increase in the risk of flooding at the site or elsewhere as a result of the development.

7.6.1.2 Wastewater Drainage

Context and Character:

There is an existing Wastewater Pumping Station (Waterfall Road WWPS) located adjacent to the northern boundary of the subject site. This existing pumping station was constructed to service the adjacent lands, existing and future developments.

The rising main from the aforementioned pump station crosses the N40 and discharges to an existing foul network running parallel to the N40. This network eventually discharges to the Carrigrennan Wastewater Treatment Plant (WWTP).

The existing foul sewer infrastructure has been deemed suitable, with upgrades, by Uisce Éireann. This is further discussed in the headings above and those that follows.

The location of this existing foul sewer is shown on Uisce Éireann Network Plans (refer to Figure 7-2 below with site outlined orange with existing foul lines represented in red dashed line) as well as within the relevant civil engineering layouts submitted as part of this application, separately.

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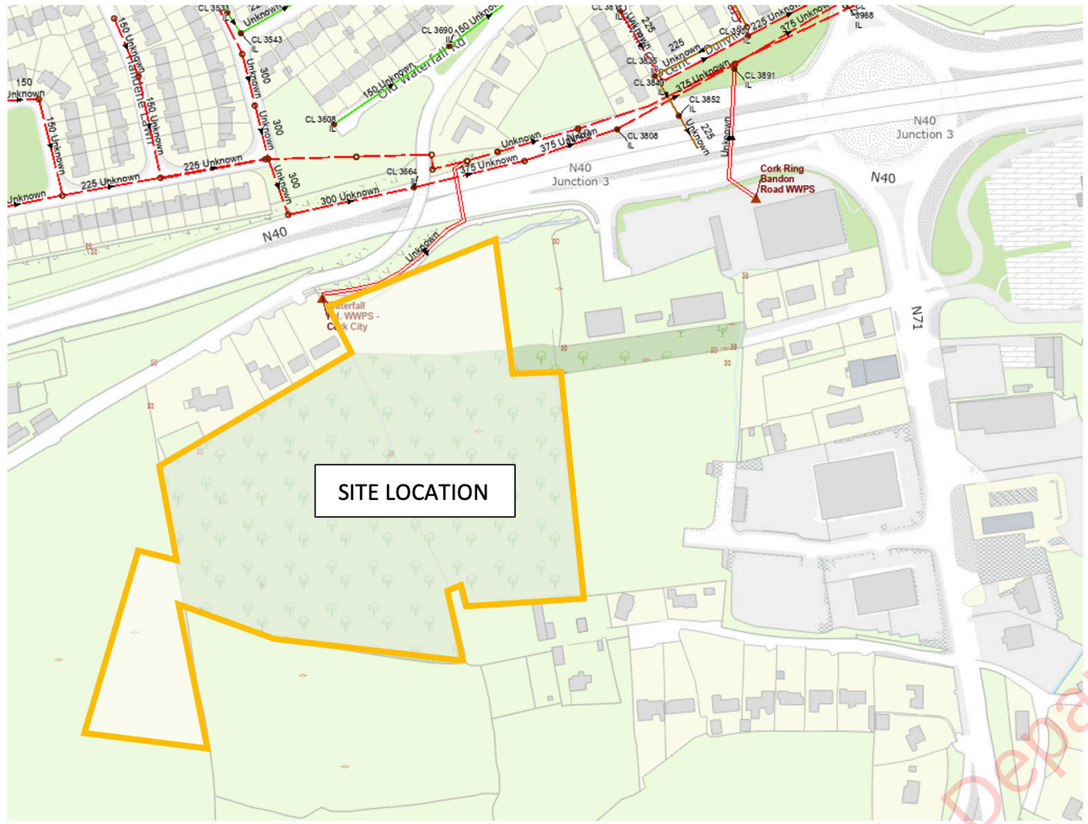


Figure 7.2 Extract from Uisce Éireann Network Plans (Site Boundary Indicative Only)

Sensitivity:

Foul drainage systems can be sensitive to changes in their design, installation, and maintenance. The performance of a foul drainage system can be affected by various factors, including:

- Damage or breakage of the existing Uisce Éireann wastewater drainage services on site has the potential to disrupt existing wastewater drainage services locally.
- Changes in the flow rate of wastewater can impact the system's ability to transport wastewater to the treatment plant. High flow rates can cause blockages and overflows, while low flow rates can cause sedimentation and accumulation of solids. Misconnection of surface water drainage systems can cause hydraulic overloading of wastewater drainage systems in periods of heavy rainfall.
- The size and slope of the pipes can affect the velocity and capacity of the wastewater transport, which can impact the system's ability to function effectively.
- The type of pipe materials used can affect the durability and lifespan of the system. Some materials may corrode over time or be susceptible to damage from tree roots or ground movements.
- Regular maintenance of the foul drainage system is essential to prevent blockages, leaks, and other issues that can impact the system's performance.
- Human errors and accidents such as excavation or equipment failure can cause damage to the system.
- Changes in land use, such as new developments or industrial activities, can increase the volume and strength of wastewater, which can impact the system's ability to handle the additional load.
- Changes in climate conditions, such as heavy rainfall or drought, can impact the flow rates and capacity of the foul drainage system.

7.6.1.3 Water Supply

Context and Character:

There is an existing 100mm diameter watermain installed as part of the Waterfall Heights development located to the west of the subject site. This main is serviced/supplied via the existing network located in Waterfall Road (L2230).

The existing water infrastructure has been deemed suitable, with upgrades, by Uisce Éireann. This is further discussed in the headings above and those that follows.

The location of this existing water infrastructure is shown on Uisce Éireann Network Plans (refer to Figure 7-3 below, site outlined orange) as well as within the relevant civil engineering layouts submitted as part of this application, separately.

Figure 7.3 Extract from Uisce Éireann Network Plans (Site Boundary Indicative Only)

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Sensitivity:

Water systems can be sensitive to changes in their design, installation, and maintenance. Factors that can affect the sensitivity of water systems include:

- The quality of the water source, such as rivers, lakes, or groundwater, can affect the treatment processes required to produce safe drinking water. Changes in source water quality due to natural or human-caused factors can impact the quality of water provided to the site.
- Aging water infrastructure, such as pipes, valves, and treatment facilities, can become vulnerable to leaks, breaks, and other failures that can impact the ability to provide quality water supply.
- Human errors and accidents such as excavation damage or equipment failure can cause leaks or supply interruptions.
- Contamination incidents, such as chemical spills or microbial outbreaks, can impact the quality of water servicing systems and threaten public health.
- Increased demand for water can result in reduced water pressure for existing customers.
- Climate change can affect the quantity and quality of water resources, as well as impact the reliability of water infrastructure during extreme weather events such as floods and droughts

7.6.1.4 Electrical Supply

Context and Character:

The existing site has overhead electrical lines, Medium Voltage (10kV/20kV), across the site (outlined orange). The location of this existing ESB infrastructure is shown on ESB Network Plans (refer to Figure 7-4 below)

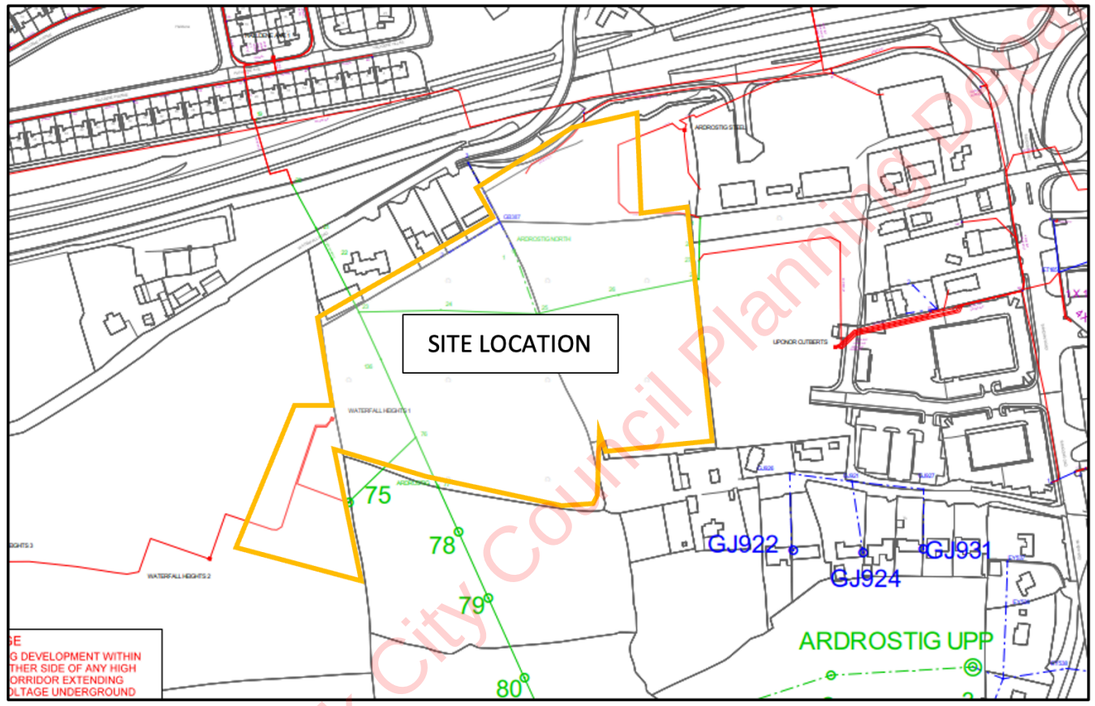


Figure 7.4 Extract from ESB Drawing 20241015_029 (Site Boundary Indicative Only)

Sensitivity:

The proposed installation will be cable based within an underground ductwork system and will have low sensitivity.

7.6.1.5 Gas Supply

There are no existing gas supply lines located within the proposed development boundary.

7.6.1.6 Telecommunications

Context and Character:

There is no existing telecommunication services located within the proposed development boundary.

Sensitivity:

The proposed installation will be cable based within an underground ductwork system and will have low sensitivity.

7.7 The 'Do Nothing' Scenario

In the do-nothing scenario (i.e. assuming the proposed development were not progressed), the built services and infrastructure at the site of the proposed development and in the immediate vicinity would likely remain as they are at present (greenfield, previously agricultural). No likely significant effects would arise in relation to material assets in this scenario.

7.8 Potential Significant Effects

7.8.1 Construction Phase

The potential significant effects associated with the Material Assets - Built Services during the construction phase of this development has been summarised below.

7.8.1.1 Surface Water Drainage

New surface water drainage systems will be constructed on site to service the development, connecting to existing surface water drainage infrastructure in the receiving environment.

Potential Direct effects of the construction phase on surface water drainage systems are:

- uncontrolled and/or misdirected surface water runoff to existing watercourses and drainage systems and to adjacent lands;
- Transmission of entrained soils/turbidity, construction materials and spilt liquids including hydrocarbons and other pollutants.

In the absence of mitigation measures the **Direct** impact of the construction phase on surface water drainage is **Negative** in quality, **Significant** in terms of significance, **Likely** in probability and **Medium-term** in duration.

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Potential Indirect, Secondary and Cumulative impacts of the construction phase on surface water drainage systems are:

- Loss of hydraulic performance and increased frequency of flooding caused by siltation of existing drainage systems.
- Erosion of existing watercourses and surrounding lands causing loss of soil stability and consequent further erosion.
- Reduction in Biodiversity

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on surface water drainage services is **Negative** in quality, **Significant** in terms of significance, **Likely** in probability and **Medium-term** in duration

7.8.1.2 Wastewater Drainage

New wastewater drainage systems will be constructed on site to service the new development, connecting to existing wastewater infrastructure in the receiving environment.

In addition to the construction of new on-site wastewater drainage services, the following alterations to existing water supply services will be performed during the construction phase:

- Upgrade of the existing Uisce Éireann sewer network to 200mm for approximately 160m.

Potential Direct effects of the construction phase on wastewater drainage services are:

- Blockage or partial reduction in the capacity of existing wastewater drainage services;
- Breakage of existing infrastructure causing network outages and uncontrolled discharges of wastewater;
- Discharges of surface water runoff to existing wastewater drainage services;
- Uncontrolled discharge of wastewater from the construction site welfare facilities to lands and watercourses downstream of the site causing pollution, potential flooding and risk to public health;

In the absence of mitigation measures the **Direct** impact of the construction phase of wastewater drainage services is **Negative** in quality, **Significant** in terms of significance, **Likely** in probability and **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative effects of the construction phase on wastewater drainage services are:

- Overflowing of existing wastewater drainage systems due to reduction in capacity or blockages caused by the works;
- Increased pumping requirements and consequent increased energy demands and servicing requirements at existing wastewater drainage pumping stations due to increased flowrates;
- Reductions in efficiency of existing wastewater treatment systems due to increased hydraulic loading and/or introduction of polluted waters;
- Reduction in Biodiversity.

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on wastewater drainage services is **Negative** in quality, **Moderate** in terms of significance, **Unlikely** in probability and **Medium-term** in duration.

Refer to Chapter 11 (Biodiversity) in relation to Indirect, Secondary and Cumulative impact on Biodiversity.

7.8.1.3 Water Supply

New water supply systems will be constructed on site to service the new development, connecting to existing water supply infrastructure at the boundary of the site.

In addition to the construction of new on-site water supply services, the following alterations to existing water supply services will be performed during the construction phase:

- Upgrade of the existing Uisce Éireann water network from 150mm to 200mm for approximately 200m.

Potential Direct effects of the construction phase are:

- Breakages of existing water supply pipework causing large outflows of water and possible local flooding and reduced water supply to premises on the local water supply network;
- Closing of valves on the existing water supply network causing a loss of water supply to premises on the local network.

In the absence of mitigation measures the **Direct** impact of the construction phase on water supply services is **Negative** in quality, **Moderate** in terms of significance, **Likely** in probability and **Medium-term** in duration.

Potential **Indirect, Secondary and Cumulative** effects of the construction phase on water supply services are likely to have no significant effects.

7.8.1.4 Electrical Supply

For Electrical Supply, the permanent electricity connections will not be live during the construction phase until near completion. Construction related activities will require temporary connection to the local electrical supply network. The potential impact from the construction phase of the proposed development on the local electrical supply network is likely to have no significant effects.

7.8.1.5 Telecommunications

No likely significant effects.

7.8.2 Operational Phase

During the operational phase, the site will contain operational surface water drainage, wastewater water drainage, water supply, electrical supply and telecommunications systems to serve the proposed development. Refer to Section 7.3 above for a description of built services for the development.

The potential significant effects associated with the Material Assets - Built Services during the operational phase of this development has been summarised below.

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7.8.2.1 Surface Water Drainage

Potential Direct effects on surface water drainage services in operation are as follows:

- Poor general maintenance causing blockage of drainage systems and overflowing with a consequent risk of flooding;
- Poor general maintenance leading to poor performance of pollution control measures in the surface water drainage system and subsequent discharges of surface water containing sediments and pollutants to existing surface water drainage systems and watercourses;
- Poor maintenance of engineered pollution reduction devices in the surface water drainage system leading to discharge of surface water containing sediments and pollutants to existing surface water drainage systems, watercourses and groundwater aquifers.

In the absence of mitigation measures the **Direct** impact of the operational phase on surface water drainage services is **Negative** in quality, **Moderate** in terms of significance, **Likely** in probability and **Permanent** in duration.

Refer to Chapter 9 (Land & Soils) in relation to Indirect, Secondary and Cumulative impact on Land & Soils.

Potential Indirect, Secondary and Cumulative effects on surface water drainage services in operation are as follows:

- Reduction in biodiversity in the wider receiving environment.

Refer to Chapter 11 – Biodiversity – in relation to Indirect, Secondary and Cumulative impact on Biodiversity.

7.8.2.2 Wastewater Drainage

Potential Direct effects on wastewater drainage services in operation are as follows:

- Misconnection of surface water drainage services on site to the wastewater drainage network during the construction phase causing overloading of the wastewater network with surface water and possible resultant reduction in performance of downstream wastewater treatment activities;
- Poor quality control during the construction phase leading to partial or full blockages, overflowing and subsequent pollution of watercourses and hazard to public health.
- Poor quality control during the construction phase leading to excessive infiltration of groundwater into the wastewater drainage system and consequent increased need for conveyance, pumping and treatment of wastewater within the existing Uisce Éireann network

In the absence of mitigation measures the **Direct** impact of the operational phase on wastewater services is **Negative** in quality, **Significant** in terms of significance, **Likely** in probability and **Permanent** in duration.

Refer to Chapter 11 – Biodiversity – in relation to Direct impact on Biodiversity.

Potential Indirect, Secondary and Cumulative effects on wastewater drainage services in operation are as follows:

- Increased need for conveyance, pumping and treatment of wastewater in the existing wastewater drainage network leading to decreased service life of existing infrastructure.

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the operational phase of wastewater drainage services is **Negative** in quality with a **Slight** significance, **Likely** probability and **Permanent** in duration.

7.8.2.3 Water Supply

Potential Direct effects on water supply services in operation are as follows:

- Poor quality control during the construction phase leading to water leakage from the site network consequent increased demand on the existing water supply network;
- Poor quality control during the construction phase leading to pipe breakages, loss of water from the network and network outages during consequent repair periods.

In the absence of mitigation measures the **Direct** impact of the operational phase on water supply services is **Negative** in quality, **Moderate** in significance, **Likely** probability, **Permanent** in duration.

Potential Indirect, Secondary and Cumulative effects on water supply services in operation are as follows:

- Increased production of water necessitated by excessive pipe leakages requiring greater energy inputs and maintenance requirements of the water treatment system

In the absence of mitigation measures the **Indirect** impact of the operational phase on water supply services is **Negative** in quality, **Slight** in terms of significance, **Likely** in probability and **Permanent** in duration.

7.8.2.4 Electrical Supply

The predicted impact of the operational phase on electrical supply services is Neutral in quality, Imperceptible in significance, Permanent in duration and **Indirect** in type

7.8.2.5 Telecommunications

The predicted impact of the operational phase on telecommunications services is Neutral in quality, Imperceptible in significance, Permanent in duration and **Indirect** in type.

7.8.3 Cumulative Effects

As part of this assessment, other offsite developments and proposed offsite developments as detailed in Chapter 1 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

These other offsite developments and proposed offsite developments will be of a similar nature to the proposed development. As a result, the cumulative impact is expected to be neutral and not significant.

7.8.4 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

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Table 7.1 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Surface Water Drainage	Negative Negative	Significant Significant	Extent 1 Extent 1	Likely Likely	Medium-term Medium-term	Direct Indirect
Wastewater Drainage	Negative Negative	Significant Moderate	Extent 2 Extent 2	Likely Unlikely	Medium-term Medium-term	Direct Indirect
Water Supply	Negative	Moderate	Extent 3	Likely	Medium-term	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 7.2 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Surface Water Drainage	Negative	Moderate	Extent 1	Likely	Permanent	Direct
Wastewater Drainage	Negative Negative	Significant Slight	Extent 2 Extent 2	Likely Likely	Permanent Permanent	Direct Indirect
Water Supply	Negative Negative	Moderate Slight	Extent 3 Extent 3	Likely Likely	Permanent Permanent	Direct Indirect

With respect to the Extent listed in Table 7- 1 and 7-2 above, the following applies;

Extent 1 – Lands and Premises adjoining the subject site, including receiving waterbodies to the north and northeast.

Extent 2 - Lands and premises within the Bishopstown areas served by existing wastewater infrastructure downstream of the site.

Extent 3 - Lands and premises served by the Inniscarra Water Treatment Plant and lands and premises adjoining the subject site.

7.9 Mitigation Measures

7.9.1 Incorporated Design Mitigation

All new-build service infrastructure is to be designed in accordance with the relevant service provider and asset owner's code of practice, which require due cognisance of the receiving environment. Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided where possible, and by association a reduction in resultant waste and machinery operation time.

It is proposed that products and materials are supplied locally, where practicable and available, in order to reduce carbon footprint of travel and production.

7.9.2 Demolition Phase Mitigation

A detailed Outline Construction and Environmental Management Plan (OCEMP), in line with the preliminary/outline CEMP submitted as part of this planning application, will be prepared and implemented by the contractor at the demolition phase. Operations expected as part of the demolition phase is limited or regarded as being not applicable.

7.9.3 Construction Phase Mitigation

A detailed Construction and Environmental Management Plan (CEMP), in line with the preliminary CEMP submitted as part of this planning application, will be prepared and implemented by the contractor at the construction phase.

7.9.3.1 General Mitigation Measures

The following mitigation measures are recommended for the construction phase of the development:

- Works shall be performed in accordance with Statutory requirements, including Health, Safety and Welfare at Work (Construction) Regulations 2013 (S.I. no. 291 of 2013).
- The works shall be supervised by suitable competent personnel responsible for delivery of the built services as per the permitted development.
- Works in existing roads shall be performed in accordance with Guidelines for Managing Openings in Public Road, Dept of Transport Tourism and Sport, Second Edition (Rev 1), April 2017.
- Works in existing public roads and pedestrian paths shall be performed in accordance with Cork City Council requirements for the management and control of roadworks in Cork City.
- The Construction and Environmental Management Plan (CEMP) prepared to accompany the planning application shall be updated with any and all additional requirements included in a Grant of Permission from the Planning Authority and shall be adopted and executed with updating as necessary to reflect changes in the construction phase.
- The Resource and Waste Management Plan (RWMP) prepared to accompany the planning application shall be updated with all additional requirements included in a Grant of Permission from the Planning Authority and shall be adopted and executed with updating as necessary to reflect changes in the construction phase.
- The locations of all existing on-site services (underground and overhead) shall be confirmed prior to the commencement of works and suitable protection measures put in place to minimise the risk of damage to existing services.
- The precise routing of electricity and telecommunications infrastructure on the site are to be agreed with the relevant service providers prior to the commencement of on-site works.
- Consultation with the relevant services providers shall be undertaken in advance of works. This will ensure all works are carried out to the relevant standards and ensure safe working practices are implemented.
- All reasonable precautions shall be taken to avoid unplanned disruptions to any services / utilities during the proposed works.
- There will be an interface established between the contractor(s) and the relevant utilities service providers / authorities during the construction phase of the proposed development. This interface will be managed in order to ensure a smooth construction schedule with no / minimal disruption to the local community

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With the implementation of these mitigation measures, above and below, the severity of the impact of the proposed development on the built services will be minimised, with tie-ins to existing services and installation of new services completed in a satisfactory manner for the relevant service providers.

7.9.3.2 Surface Water Drainage

In addition to the General Mitigation Measures listed above, the following measures shall be implemented in relation to surface water drainage services:

- A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted surface water drainage system free of significant defects.

7.9.3.3 Wastewater Drainage

In addition to the General Mitigation Measures listed above, the following measures shall be implemented in relation to wastewater drainage services:

- Uisce Éireann shall be consulted prior to commencement of works.
- Existing wastewater drainage infrastructure shall be protected in accordance with Uisce Éireann requirements.
- Wastewater drainage services to be adopted by Uisce Éireann shall be constructed in accordance as per the permitted development and in accordance with the following:
  - » Code of Practice for Wastewater Infrastructure, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments, Uisce Éireann, July 2020 (Revision 2);
  - » Wastewater Infrastructure Standard Details, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments, Uisce Éireann, July 2020 (Revision 2)
  - » Quality Assurance (QA) Field Inspection Requirements Manual, Connections and Developer Services (A Guide for Self-Lay Developers), Uisce Éireann, August 2020 (Revision 3)
- In respect of wastewater drainage services not to be adopted by Uisce Éireann, including temporary wastewater drainage, a quality management plan shall be created and implemented to ensure that the works are executed to provide a suitable wastewater drainage system free of significant defects and in accordance with the recommendations of Building Regulations Technical Guidance Document H – Drainage and Waste Water disposal (published 2010, re-printed 2016)

7.9.3.4 Water Supply

In addition to the General Mitigation Measures listed above, the following measures shall be implemented in relation to water supply services:

- Uisce Éireann shall be consulted prior to commencement of works
- Existing water supply infrastructure shall be protected in accordance with Uisce Éireann requirements.
- Water supply services to be adopted by Uisce Éireann shall be constructed in accordance as per the permitted development and in accordance with the following:
  - » Code of Practice for Water Infrastructure, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments, Uisce Éireann, July 2020 (Revision 2);
  - » Water Infrastructure Standard Details, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments, Uisce Éireann, July 2020 (Revision 4)
  - » Quality Assurance (QA) Field Inspection Requirements Manual, Connections and Developer Services (A Guide for Self-Lay Developers), Uisce Éireann, August 2020 (Revision 3)
- In respect of water supply services not to be adopted by Uisce Éireann, including temporary water supply, a quality management plan shall be created and implemented to ensure that the works are executed to provide a suitable water supply system free of significant defects and in accordance with the recommendations of Building Regulations Technical Guidance Document G – Hygiene (published 2008, Reprinted July 2011)

7.9.3.5 Electrical Supply

The following measures shall be implemented in relation to Electrical Supply services:

- ESB Networks will be consulted prior to commencement of the works
- A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted Electrical Supply System free of significant defects.

7.9.3.6 Telecommunications

The following measures shall be implemented in relation to Telecommunication Supply services:

- Openeir will be consulted prior to commencement of the works
- A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted Telecommunications Supply System free of significant defects.

7.9.4 Operational Phase Mitigation

The design and construction of the required services infrastructure in accordance with the relevant guidelines and codes of practice is likely to mitigate any potential impacts during the operational phase of the development, with the exception of any routine maintenance of the site services.

Any additional mitigation measures required for the proposed built services, if required, during the operational phase will be as advised by the relevant service provider.

7.9.4.1 Surface Water Drainage

The surface water drainage includes various components to control and ensure the quantity and quality of surface water runoff in accordance with design requirements. Inspection and maintenance of components of the system shall be performed on a regular and scheduled basis to ensure the effective functioning of the system and the mitigation of risk to the receiving environment, for both adoptable and non-adoptable parts of the system.

7.9.4.2 Wastewater Drainage

The wastewater drainage network, when completed, will be vested to Uisce Éireann who will have responsibility for the ongoing maintenance and operation of the services generally.

Wastewater drainage services not to be vested to Uisce Éireann consist of drainage systems within individual premises upstream of each Customer Connection Chamber to each premises. Wastewater drainage systems within individual premises are designed to operate without the need for maintenance. However, this depends on individual good practices. To this end, the following information and educational material will be distributed to purchasers at handover:

- Cork City Council Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws 2019.

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- Think Before You Flush information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce.
- Think Before You Pour information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce.
- The Dirty Dozen information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce.

The sale or lease of commercial premises that generates grease and oil and food residue as part of its commercial output will include a requirement to install grease traps in accordance with EN 1825- 1:2004 Grease separators Principles of design, performance and testing, marking and quality control and to enter an agreement with a suitably licenced operator to maintain and clean the grease traps on an appropriate maintenance schedule.

7.9.4.3 Water Supply

The water supply network when completed will be vested to Uisce Éireann who will have responsibility for the ongoing maintenance and operation of the service.

Water supply services not to be vested to Uisce Éireann consist of water supply pipework within individual premises downstream of the Customer Connection and Boundary Box to each premises. Water supply systems within individual premises are designed to operate without the need for maintenance. Each purchaser or lease holder will be informed of the location of the shutoff valve at the connection to each premises so that the user may shut off the water supply should the need arise.

7.9.4.4 Electrical Supply

The operational electricity demand of the proposed development has already been calculated and agreed at 12KVa per unit. The connection to the existing network to supply the site will form part of the customer Agreement with ESB Networks. ESB Networks will take charge of their system on completion and will be responsible for the ongoing maintenance and operation of the service.

7.9.4.5 Telecommunications

The operational telecommunications requirement of the proposed development has already been calculated and agreed. The connection to the existing network to supply the site will form part of the customer Agreement with Openeir. Openeir will take charge of their system on completion and will be responsible for the ongoing maintenance and operation of the service

7.10 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

Assuming the full and proper implementation of the mitigation measures set out herein; and given that the design, construction and operation of utilities infrastructure are strictly controlled by the respective utility provider and authorities (i.e. Uisce Water, ESB, GNI and so on); the residual impact of the proposed development is as described below.

7.10.1 Construction Phase

Residual impacts on the built services during the construction phase is considered to be temporary and occasional in nature and not significant, where service is unavoidably disrupted to facilitate the construction phase.

7.10.1.1 Surface Water Drainage

Potential Direct effects of the construction phase on surface water drainage systems are:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the construction phase on surface water drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative impacts of the construction phase on surface water drainage systems are:

- No likely significant effects

With the implementation of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on surface water drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Refer to Chapter 11 – Biodiversity – in relation to Direct impact on Biodiversity.

7.10.1.2 Wastewater Drainage

Potential Direct effects of the construction phase on wastewater drainage services are:

- No likely significant effects.

With the implementation of mitigation measures the **Direct** impact of the construction phase of wastewater drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative effects of the construction phase on wastewater drainage services are:

- No likely significant effects

With the implementation of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on wastewater drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Refer to Chapter 11 – Biodiversity – in relation to Indirect, Secondary and Cumulative impact on Biodiversity.

7.10.1.3 Water Supply

Potential Direct effects of the construction phase are:

- No likely significant effects

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With the implementation of mitigation measures the **Direct** impact of the construction phase on water supply services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative effects of the construction phase on water supply services are:

- No likely significant effects

7.10.1.4 Electrical Supply

Potential Indirect, Secondary and Cumulative effects of the construction phase on electrical supply services are:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the construction phase on electrical supply services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

7.10.1.5 Telecommunications

Potential Indirect, Secondary and Cumulative effects of the construction phase on electrical supply services are:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the construction phase on telecommunications services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

7.10.2 Operational Phase

Residual impacts on the built services during the operational phase given the new infrastructure and upgrades to the existing networks is considered to be permanent with a constant occurrence, positive and beneficial to all the end users.

7.10.2.1 Surface Water Drainage

Potential Direct effects on surface water drainage services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on surface water drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Permanent** in duration.

Refer to Chapter 9 – Land & Soils – in relation to Indirect, Secondary and Cumulative impact on Land & Soils.

Potential Indirect, Secondary and Cumulative effects on surface water drainage services in operation are as follows:

- No likely significant effects

Refer to Chapter 11 – Biodiversity – in relation to Indirect, Secondary and Cumulative impact on Biodiversity.

7.10.2.2 Wastewater Drainage

Potential Direct effects on wastewater drainage services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on wastewater services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

Refer to Chapter 11 – Biodiversity – in relation to Direct impact on Biodiversity.

Potential Indirect, Secondary and Cumulative effects on wastewater drainage services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Indirect, Secondary and Cumulative** impact of the operational phase of wastewater drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Permanent** in duration.

7.10.2.3 Water Supply

Potential Direct effects on water supply services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on water supply services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

Potential Indirect, Secondary and Cumulative effects on water supply services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Indirect, Secondary and Cumulative** impact of the operational phase on water supply services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration

7.10.2.4 Electrical Supply

Potential Direct effects on electrical supply services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on electrical supply services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

7.10.2.5 Telecommunications

Potential Direct effects on telecommunication services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on telecommunications services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

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7.10.3 Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 7.3 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Surface Water Drainage	Neutral Neutral	Insignificant Insignificant	Extent 4 Extent 4	Likely Likely	Medium-term Medium-term	Direct Indirect
Wastewater Drainage	Neutral Neutral	Insignificant Insignificant	Extent 5 Extent 5	Likely Likely	Medium-term Medium-term	Direct Indirect
Water Supply	Neutral	Insignificant	Extent 6	Likely	Medium-term	Direct

The following Table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 7.4 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Surface Water Draiange	Neutral	Insignificant	Extent 4	Likely	Permanent	Direct
Wastewater Drainage	Neutral Neutral	Insignificant Insignificant	Extent 5 Extent 5	Likely Likely	Permanent Permanent	Direct Indirect
Water Supply	Neutral Neutral	Insignificant Insignificant	Extent 6 Extent 6	Likely Likely	Permanent Permanent	Direct Indirect

With respect to the Extent listed in Table 7- 3 and 7-4 above, the following applies;

Extent 4 – Lands and Premises adjoining the subject site, including receiving waterbodies to the north and northeast.

Extent 5 - Lands and premises within the Bishopstown areas served by existing wastewater infrastructure downstream of the site

Extent 6 - Lands and premises served by the Inniscarra Water Treatment Plant and lands and premises adjoining the subject site.

7.10.4 Cumulative Residual Effects

Considering the proposed future developments listed under section 7.8.4 above, the cumulative residual effects are considered to be neutral and not significant.

7.11 Risk of Major Accidents or Disasters

Through the implementation of mitigation measures, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that are likely to lead to significant residual impacts or environmental effects or impacts on human health.

7.12 Worst Case Scenario

The European Commission EIAR Guidelines (2017) suggest that different future scenarios including a worstcase scenario should be described. However, systematic risk assessments are only employed only where the "worst case" impacts pose significant threats to the environment and/or human health. It is important to note that this is not applicable in the case of the proposed development and the likelihood of such a scenario occurring in respect of the proposed development is negligible.

7.13 Interactions

Interactions between Material Assets and other environmental topics are outlined throughout this EIAR document. The likely interactions between Material Assets and other environmental factors include interactions between the proposed drainage and wastewater arrangements and Chapter 10: Water and Hydrology of this EIAR.

7.14 Monitoring

All potable water will be cleaned and tested to the satisfaction of Uisce Éireann prior to the connection to the public potable water. In addition, all connections to the public potable water and foul water sewer will be carried out under the supervision of Uisce Éireann.

All new infrastructure, which is to serve the proposed development, is to be routinely inspected with any maintenance carried out, as required. Any monitoring of the built services required during the operational phase of the proposed project will be as advised by the relevant services providers.

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7.15 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 7.5 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Surface Water Drainage, Wastewater Drainage, Water Supply	Implement the Construction Environmental Management Plan (CEMP)	Normal monitoring in accordance with the CEMP
Surface Water Drainage, Wastewater Drainage, Water Supply	Implement the Resources and Waste Management Plan (RWMP)	Normal monitoring in accordance with the RWMP
Surface Water Drainage, Wastewater Drainage, Water Supply	Liaise with all relevant Statutory Authorities and Service Providers prior to commencement of construction	No particular requirements
Surface Water Drainage	Create and implement a surface water drainage construction quality control system	Inspection and checking in accordance with the implemented quality control system
Wastewater Drainage, Water Supply	Implement the Uisce Eireann Quality Assurance system for construction of wastewater and water supply services	Inspection and checking in accordance with the requirements of the QA system
Electricity Supply	Implement the ESB Quality Assurance system for construction of electrical services infrastructure	Normal monitoring in accordance with the ESB
Telecommunications	Implement the Openeir Quality Assurance system for construction of telecommunication services infrastructure	Normal monitoring in accordance with Openeir

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 7.6 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Surface Water Drainage	Implement a Surface Water Management and Maintenance Plan	Implement the scheduled monitoring as part of the Surface Water Management and Maintenance Plan
Electricity Supply	Implement the ESB Quality Assurance system for construction of electrical services infrastructure	Normal monitoring in accordance with the ESB
Telecommunications	Implement the Openeir Quality Assurance system for construction of telecommunication services infrastructure	Normal monitoring in accordance with Openeir

7.16 Conclusion

The construction and operation of Built Assets: Services has the potential to result in environmental impacts on surface water drainage systems, wastewater drainage systems, water supply systems, electrical supply systems, telecommunications systems. Mitigation measures as described in this chapter shall be implemented during the construction phase and during the operational phase to minimise the risk of impact on the environment.

7.17 References and Sources

- Greater Dublin Strategic Drainage Study 2005 (GDSDS)
- Uisce Éireann Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03, July 2020, Revision 2)
- Uisce Éireann Code of Practice for Water Infrastructure (IS-CDS-5020-03, July 2020, Revision 2)
- Greater Dublin Regional Code of Practice (V6)
- The Building Regulations 1997, as amended, ('the Building Regulations')
- Department of the Environment's Building Regulations "Technical Guidance Document B - Fire Safety (2020)"
- Technical Guidance Document H – Drainage and Waste Water Disposal (2016)
- Department of the Environment's "Recommendations for Site Development Works for Housing Areas" (1998).
- Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal".
- BS EN 752: 2008 "Drain and Sewer Systems Outside Buildings".
- Guidelines on the Information to be Contained In Environmental Impact Assessment Reports (May 2022) published by the EPA Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU, 2017) published by the European Commission
- https://www.esbnetworks.ie/staying-safe/contractor-safety/digging-and-excavation-work
- https://www.gasnetworks.ie/corporate/freedom-of-information/make-a-request/
- https://cbyd.emaps.eircom.ie/Eircom-CBYD/

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CHAPTER EIGHT

MATERIAL ASSETS: WASTE

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CHARTERED PLANNING CONSULTANTS

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CHAPTER EIGHT

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CHAPTER 8 | Material Assets: Waste

8.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on Material Assets - Waste as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and the EPA 2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports during the construction and operational phases of the proposed development, as described in Chapter 2 (Project Description).

A site-specific Resource Waste Management Plan (RWMP) has been prepared by AWN Consulting to guide and manage the waste generated during the construction (including excavation) phase of the proposed development (including excavation works) and has been included as Appendix 8.1. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects (2021)*.

A separate Operational Waste Management Plan (OWMP) has been prepared for the operational phase of the proposed Development and is included as Appendix 8.2 of this Chapter.

This Chapter has been prepared in accordance with European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017), the EPA Guidelines on the Information to be contained in EIAR (2022).

These documents will ensure the management of wastes arising at the development site in accordance with legislative requirements and best practice standards.

8.2 Expertise & Qualifications

This Chapter has been prepared by Isabel Gogarty Meade (BSc ENV) of AWN Consulting. Isabel is an Environmental Consultant in the Environmental Team at AWN. She holds a BSc in Environmental Science from University College Cork. Isabel has experience working on a range of developments from residential to commercial and specialises in waste management.

This Chapter has been approved by Chonaill Bradley (Bsc ENV,PG Dip Circ Econ, AssocCIWM) of AWN Consulting. Chonaill is an Associate in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia and a Postgraduate Diploma in Circular Economy Leadership for the Built Environment from the Atlantic Technological University, Galway. He is an Associate Member of the Institute of Waste Management (AssocCIWM). Chonaill has over ten years' experience in the environmental consultancy sector and specialises in waste management.

8.3 Proposed Development

The following development is proposed:

- (a) the construction of a residential development of 246 No. residential units
- (b) a creche facility and
- (c) all associated ancillary development works.

Vehicular access to the site is proposed via the Waterfall Road and the residential site to the west currently under construction (Waterfall Heights). Pedestrian access to the site is proposed via that site to the Waterfall Road and also via the permitted active travel route which will run to the north of the site (under construction) which then links to an existing path/cycleway which runs to the Bandon Road roundabout. Future linkages to adjoining sites are indicated as part of the development including vehicular links to the east via the site to the north of the permitted Primary Care Centre and to the lands to the south and pedestrian links to the east via the Primary Care Centre site and the site to the north. Part of the site was included in the application site for the adjoining lands – i.e. the crèche location and the active travel route to the north. 6 No. bike stores are proposed – 4 adjoining the apartment blocks to the north, 1 near the proposed crèche and the other to the north of the crèche.

8.3.1 spects Relevant to this Chapter

The aspects of the development that will be considered as part of this chapter are the existing site conditions, existing site use and the waste that will be generated as part of the construction and operation of the proposed development. These aspects will be considered together with the proposed development use. This section should be read in conjunction with the design drawings and reports which accompany this planning application.

8.4 Methodology

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This Chapter is based on the proposed development, as described in Chapter 2 (Project Description) and considers the following aspects:

- Legislative context;
- Construction phase (including site excavation works); and
- Operational phase.

A desktop study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated and are included in Section 8.6 of this chapter. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 8.9.

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A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 9 of this EIAR (Land & Soils).

8.4.1 Relevant Legislation & Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 8.1).



Figure 8.1 Waste Hierarchy (Source: European Commission).

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 8.2).

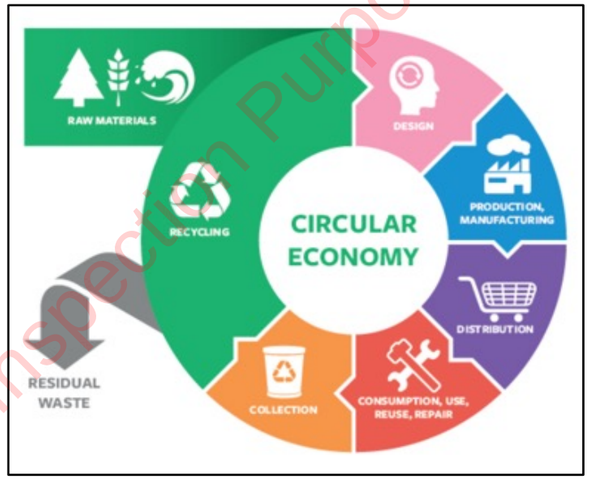


Figure 8.2 Circular Economy (Source: Repak).

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, *Waste Action Plan for a Circular Economy (WAPCE) – Waste Management Policy in Ireland*, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, A Resource Opportunity, in 2012.

One of the first actions to be taken from the WAPCE was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less' (2021)* to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The *Circular Economy and Miscellaneous Provisions Act 2022* was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will work to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's '*Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021).* The guidance documents, B*est Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects and Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers (FÁS & Construction Industry Federation, 2002)*, were also consulted in the preparation of this assessment.

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There are currently no national guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the National Waste Management Plan for a Circular Economy 2024 – 2030 (NWMPCE) (2024), BS 5906:2005 Waste Management in Buildings – Code of Practice, the Cork City Council (CCC) Waste Management (Segregation, Storage & Presentation of Household and Commercial Waste) Bye-Laws (2019), the EPA National Waste Database Reports 1998 – 2020, the Circular Economy and National Waste Database Report 2021-2022 (2024) and the EPA National Waste Statistics Web Resource.

8.4.2 Terminology

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows: -

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

a) the quantity of waste, including through the re-use of products or the extension of the life span of products;

b) the adverse impacts of the generated waste on the environment and human health; or

c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

8.4.3 Site Surveys/Investigations

Site investigations were carried out by IGSL in June 2025. The soil testing was performed by Eurofins Chemists Ltd. to test for Landfill Waste Acceptance Criteria (WAC) and tested for specific pollutants and asbestos. No elevated levels of contaminants were found in the test samples, and all samples were classified for inert waste landfill. No asbestos was detected in the samples taken. Further details on the soil testing results can be found in Chapter 9 (Land & Soils).

A site invasive species survey was undertaken by Enviroguide in July 2025. This included a site walkover survey of the entire site and perimeter to search for any invasive species listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations* 2011 (as amended).

High-impact Cherry Laurel (*Prunus laurocerasus)* was recorded in insolated pockets on Site along hedgerows and medium-impact Winter Heliotrope (*Petasites pyrenaicus*) and Sycamore (*Acer pseudoplantanus*) were also present with Sycamore now establishing throughout the cleared areas of the Site. However, no Third Schedule Invasive Species were found on site. Further detail on the invasive species survey and detailed mitigation measures can be found in Chapter 11 (Biodiversity).

The assessment of the impacts of the proposed development, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

8.4.4 Consultation

Consultation was undertaken with Cork City Council in the form of a pre-application consultation.

8.5 Difficulties Encountered

Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

While it is possible to initially select a licensed waste facility for soil disposal, there is potential to encounter contaminated material or material with naturally occurring variations in minerals and chemicals that necessitates sending it to a different suitably licensed facility. The sampling and testing yet to be carried out in the Site Investigation (SI) process will provide spot samples, and further testing will be required during the excavation process, as the true condition of all excavated materials cannot be ascertained with certainty until this is undertaken.

There is a number of licensed, permitted and registered waste facilities in the Cork Area, Southern regions and across Ireland and Northern Ireland. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

Licensed waste facilities have annual limitations on material that they can import as part of their license agreements. Because of this it would not make it possible to commit to a singular specific receiving facility as it is not available throughout the excavation phase. It would not be viable to cease a development and wait until a receiving facilities annual receiving quotas are reset. In a normal development waste facilities would switch between facilities with available capacity.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability. The waste facilities selected will ultimately be selected to minimise the environmental impacts on the surrounding environment.

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8.6 Baseline Environment

In terms of waste management, the receiving environment is largely defined by CCC as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the NWMPCE 2024 – 2030 and the WAPCE.

The waste management plans set out the following targets for waste management in the region:

- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Waste Management Planning Offices have issued a National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) in March 2024, which supersedes the southern regional (SR) waste management plan and the two other regional waste management plans. The NWMPCE does not however dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

The Cork City Development Plan 2022 – 2028 sets out the policies and objectives for the CCC area which reflect those set out in the regional waste management plan and can be found in Appendix 8.1 and 8.2.

In terms of physical waste infrastructure, CCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the Cork Area, Southern regions and across Ireland and Northern Ireland for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which will be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability.

A full description of the proposed development can be found in Chapter 2 (Project Description). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

8.6.1 Demolition

There is no demolition associated with this development and as such there will be no demolition waste generated as part of this application.

8.6.2 Construction

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated.

There will be soil and stones excavated to facilitate construction of new foundations and landscaping. The project engineers (OSL) have estimated that c. 15,665.48 m^3 of material will need to be excavated to do so. It is currently envisaged that there will be an opportunity to reuse c. 2,210.52 m^3 of clean excavated soil on site for use in landscaping and fill. In the case that any excavated soil is tested and deemed contaminated and unfit for reuse on-site, it will need to be removed offsite. There will be c. 13,454.96 m^3 of excavated material that will be unable to be reused on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

When material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Regulation 27 (By-products), as amended, of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2011-2020, (Previously Article 27 of the European Communities (Waste Directive). For more information in relation to the envisaged management of by-products, refer to the RWMP (Appendix 8.1).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2019). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. Any surplus excavated material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP (Appendix 8.1). The RWMP provides an estimate of the main waste types likely to be generated during the Construction phase of the proposed development. These are summarised in Table 8.1, below.

Table 8.1 Predicted On and Off-Site Reuse, Recycle and Disposal Rates for Construction Waste.

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	492.7	10	49.3	80	394.2	10	49.3
Timber	418.1	40	167.2	55	229.9	5	20.9
Plasterboard	149.3	30	44.8	60	89.6	10	14.9
Metals	119.4	5	6.0	90	107.5	5	6.0
Concrete	44.8	30	13.4	65	29.1	5	2.2
Other	224.0	20	44.8	60	134.4	20	44.8
Total	**1448.3**		**325.5**		**984.7**		**138.1**

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8.6.3 Operational Stage

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site. It is envisaged that waste types will be generated from the residential units and the creche unit.

The total estimated waste generation for the proposed development for the main waste types, based on the AWN waste generation model (WGM) incorporating EPA National Waste reports data, EPA National Waste Statistics Web Resource and floor use per m^2 of the proposed development, is presented in Tables 8.2 – 8.3, below, and is based on the uses and areas as advised by the project architect. Further break down of the estimated waste generation during the operational phase for each of the residential units can be found in the OWMP (Appendix 8.2).

Table 8.2 Estimated Waste Generation During Operational Phase for Creche Unit.

Waste Type	Waste Volume (m^3 / week)
	Creche Unit
Organic Waste	0.08
Dry Mixed Recyclables	2.75
Glass	0.01
Mixed Non-Recyclables	1.50
Total	4.33

Table 8.3 Estimated Waste Generation During Operational Phase for Residential Units.

Waste Type	Waste Volume (m^3 / week)
	Residential Units
Organic Waste	4.18
Dry Mixed Recyclables	29.60
Glass	0.81
Mixed Non-Recyclables	15.57
Total	50.15

The residents and creche unit staff will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. As required, the residents and creche tenants will need to bring these segregated wastes from their units to their respective Waste Storage Areas (WSAs). The house units will have individual areas to store their waste and residents in apartment blocks or without access to individual WSAs will have a designated shared WSA. The creche unit will have a separate designated WSA. All shared WSA's and the creche WSA can be viewed on the plans submitted with the application and in the OWMP (Appendix 8.2).

The OWMP seeks to ensure the development contributes to the targets outlined in the NWMPCE and the CCC Waste Bye-laws.

8.7 The 'Do Nothing' Scenario

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no excavation or construction at this site. There would continue to be no operational waste generated from at the site. There would, therefore, be a **neutral effect** on the environment in terms of waste.

On this site it is likely that in the absence of this subject proposal that a development of a similar nature would be progressed on the site that accords with national and regional policies, which can be found in appendix 8.1 and appendix 8.2, and therefore the likely significant effects would be similar to this proposal.

8.8 Potential Significant Effects

8.8.1 Demolition Phase

There is no demolition associated with this development and as such there will be no potential significant effects produced from demolition.

8.8.2 Construction Phase

The impact assessment in this section relates to all phases of construction including site excavations and construction works.

The proposed Development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative.**

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant and negative.**

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the Southern Region which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative.**

There is a quantity of material which will need to be excavated to facilitate the proposed development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 9 (Land & Soils). It is anticipated that all clean excavated soil can be reused on-site. In the event that excavated material is found to be contaminated it will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative.**

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8.8.3 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant and negative.**

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative.**

Waste contractors will be required to service the proposed development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant and negative.**

8.8.4 Cumulative Effects

If waste material are not managed and stored correctly and in the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant and negative.**

8.8.5 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 8.4 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Litter Pollution	Negative	Significant	Local	Likely	Short-Term	Indirect & Direct
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Likely	Long-Term	Direct
Insufficient Waste Facilities	Negative	Significant	Local & Regional	Unlikely	Short-Term	Direct
Lack of waste Classification	Negative	Significant	Local & Regional	Likely	Short-Term	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 8.5 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Likely	Long-Term	Direct
Poor Waste Segregation	Negative	Significant	Local & Regional	Likely	Long-Term	Direct
Litter Pollution	Negative	Significant	Local & Regional	Likely	Short-Term	Direct

8.9 Mitigation Measures

8.9.1 Incorporated Design Mitigation

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concept of the 'Waste Hierarchy' and 'Circular Economy' is employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The circular economy principle aims to keep materials, components, and products in-use in the economy for as long as possible. In circularity, the key objective is to design consumption and production systems to create and retain value. Both principles have been applied and will further be applied during the detailed design, construction and operational phases.

8.9.2 Demolition Phase Mitigation

There is no demolition associated with this development and as such there will be no need for mitigation measures associated with demolition.

8.9.3 Construction Phase Mitigation

The following mitigation measures will be implemented during the excavation and construction phase of the proposed development:

As previously stated, a project specific RWMP has been prepared in line with the requirements of the EPA Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and is included as Appendix 8.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

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- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 8.1) in agreement with CCC and in compliance with any planning conditions, or submit an addendum to the RWMP to CCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases and should treat the document as outlined in the guidance as a live document.

A quantity of topsoil and sub soil will need to be excavated to facilitate the proposed development. The project design team have estimated that all clean excavated soil can be reused on-site. In the event that any excavated soil is found to be contaminated it will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out where possible to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
  - » Concrete rubble (including ceramics, tiles and bricks);
  - » Plasterboard;
  - » Metals, and
  - » Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 of the EC (Waste Directive) Regulations (2011-2020). EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, the NWMPCE (2024). It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

8.9.4 Operational Phase Mitigation

The following mitigation measures will be implemented during the operational phase of the proposed development:

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins, skips or other suitable receptacles in a designated, easily accessible areas of the site.

- The Staff / Facilities Management of the Site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – for the authoring and implementation of an Operational Waste Management Strategy, ensuring a high level of recycling, reuse and recovery at the site of the proposed development.
- The Staff/ Facilities Management will regularly audit the onsite shared waste storage facilities and infrastructure and maintain a full paper trail of waste documentation for all waste movements from the site.
- Residential units/houses with their own individual waste storage areas will be required to maintain their WSAs and manage their waste in accordance with the local waste bye-laws.

The following mitigation measures will be implemented:

- The Residents/ Creche Tenant / Staff / Facilities Management will ensure on-Site segregation of all waste materials into appropriate categories, including (but not limited to):
  - » Organic waste;
  - » Dry Mixed Recyclables;
  - » Mixed Non-Recyclable Waste;
  - » Glass;
  - » Cardboard;
  - » Plastic;
  - » Waste Electrical and Electronic Equipment (WEEE) including computers, printers and other ICT equipment;
  - » Cooking oil;
  - » Cleaning chemicals (paints, adhesives, resins, detergents, etc.);
  - » Furniture (and from time-to-time other bulky waste); and
  - » Abandoned bicycles
- The Residents/ Creche Tenant / Staff / Facilities Management will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The Residents/ Creche Tenant / Staff / Facilities Management will ensure that all waste collected from the site of the proposed development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The Residents/ Creche Tenant / Staff / Facilities Management will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the NWMPCE (2024) and the CCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

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8.10 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

The implementation of the mitigation measures outlined in Section 8.9 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the proposed development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

8.10.1 Demolition Phase

There is no demolition associated with this development and as such there will be no residual impact on the environment caused from demolition.

8.10.2 Construction Phase

A carefully planned approach to waste management as set out in Section 8.9.3 and adherence to the RWMP (which includes mitigation) (Appendix 8.1) during the construction phase will ensure that the predicted effect on the environment will be **short-term, imperceptible** and **neutral**.

8.10.3 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 8.9.4 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be **long-term, imperceptible** and **neutral.**

8.10.4 Summary of Post-mitigation Effects

The implementation of the mitigation measures outlined in Section 8.9 will ensure that high rates of reuse, recovery and recycling are achieved at the site of the proposed development during the construction and operational phases and the waste will be correctly managed. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 8.6 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Litter Pollution	Negative	Not Significant	Local	Unlikely	Short-Term	Indirect & Direct
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Unlikely	Long-Term	Direct
Insufficient Waste Facilities	Negative	Significant	Local & Regional	Unlikely	Short-Term	Direct
Lack of waste Classification	Negative	Significant	Local & Regional	Unlikely	Short-Term	Direct

The following Table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 8.7 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Unlikely	Long-Term	Direct
Poor Waste Segregation	Negative	Not Significant	Local & Regional	Unlikely	Long-Term	Direct
Litter Pollution	Negative	Not Significant	Local & Regional	Unlikely	Short-Term	Direct

8.10.5 Cumulative Residual Effects

8.10.5.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. Multiple developments in the area could potentially be developed concurrently or overlap in the construction phase.

Developments that potentially could overlap during the construction phase are identified in Chapter 1. All cumulative developments outlined in Chapter 1 have been taken into account.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be **short-term, not significant** and **neutral.**

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8.10.5.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area and the developments planned for the surrounding land will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible** and **neutral**.

8.11 Risk of Major Accidents or Disasters

There is no Risk of Major Accidents or Disasters related to Material Assets Waste and the proposed development.

8.12 Worst Case Scenario

In a worst-case scenario, if no mitigation measures found in Section 8.9 are followed, poor onsite waste management, non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste offsite and result in negative environmental impacts or pollution as shown in Section 8.8.

8.13 Interactions

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR.

8.13.1 Land & Soils

During the construction phase, excavated soil and stone (c. 15,665.48 m^3) will be generated from the excavations required to facilitate site levelling, construction of new foundations and installations of site services. It is currently envisaged that all clean excavated soil will be reused on-site. In the event that any excavated soil is found to be contaminated it will need to be removed off-site.

If material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 8, Chapter 9 (Land & Soils) and the requirements of the RWMP (Appendix 8.1), will ensure the effect is **long-term, imperceptible** and **neutral.**

8.13.2 Traffic & Transport

Local traffic and transport will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the proposed Development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movements will be imperceptible in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 6 (Material Assets: Traffic & Transport). Provided the mitigation measures detailed in Chapter 6 and Chapter 8 are adhered to, the predicted effects are **short to long-term**, **imperceptible** and **neutral.**

8.13.3 Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and mitigation measures in Chapter 4 (Population & Human Health) and Chapter 8, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be **long-term, imperceptible and neutral**.

8.13.4 Biodiversity

The potential impacts on biodiversity in relation to the generation of waste during the construction or operational phases are that the incorrect management of waste could result in littering, pollution issues or vermin in areas affected.

Adherence to the mitigation measures set out in this chapter (Chapter 8), RWMP (Appendix 8.1) , OWMP (Appendix 8.2) and in Chapter 11 (Biodiversity) will ensure the associated effect is **long-term, imperceptible** and **neutral.**

8.14 Monitoring

The management of waste during the construction phase will be monitored by the Contactor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the Operator / Buildings Manager to ensure effective implementation of the mitigation measures outlined in Section 8.9 internally and by the nominated waste contractor(s).

8.14.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting schedule targets. The RWMP specifies the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed Development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

8.14.2 Operational Phase

During the operational phase, waste generation volumes should be monitored by the Operator / Buildings Management. There may be opportunities to reduce the number of bins and equipment required in the shared and creche Waste Storage Areas (WSA's), where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contactor costs.

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8.15 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 8.8 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Quality	Significance
Litter Pollution	The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction phase.	The Contractor will review and maintain waste records and site audits
Unlicensed Waste Collection (Illegal Dumping)	All waste leaving the site will be recorded and copies of relevant documentation maintained.	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Insufficient Waste Facilities	All waste leaving the site will be recorded and copies of relevant documentation maintained.	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Lack of waste Classification	All waste material leaving site will be correctly classified and segregation prior to removal where possible.	An appointed Waste Manager will monitor all onsite waste segregation and classification

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 8.9 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Quality	Significance
Unlicensed Waste Collection (Illegal Dumping)	The Operator / Buildings Manager will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.	The Operator / Buildings Manager will maintain waste receipts onsite for a period of 7 years and make available to CCC as requested.
Poor Waste Segregation	The Operator / Buildings Manager will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.	Waste generation volumes will be monitored by the Operator / Buildings Manager.
Litter Pollution	The Operator / Buildings Manager will ensure that all waste collected from the Site of the proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available	Shared and creche waste storage areas will be monitored by the Operator / Buildings Manager.

8.16 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to waste management. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter and the attached RWMP, the overall predicted impact of the proposed development is **long-term, imperceptible** and **neutral**.

8.17 References & Sources

1. Waste Management Act 1996 - 2021 (No. 10 of 1996) as amended.

2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.

3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.

4. The Circular Economy and Miscellaneous Provisions Act 2022

5. Regional Waste Management Planning Offices, National Waste Management Plan for a Circular Economy 2024 – 2030 (2024).

6. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).

7. European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).

8. Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022)

9. Forum for the Construction Industry – Recycling of Construction and Demolition Waste.

10. Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).

11. DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)

12. Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)

13. Department of Environment, Heritage and Local Government, Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006).

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14. FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).

15. Cork City Council (CCC) City of Cork (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws, 2018.

16. CCC, Cork City Development Plan 2021 – 2027 (2021).

17. BS 5906:2005 Waste Management in Buildings – Code of Practice

18. Planning and Development Act 2000 (No. 30 of 2000) as amended

19. Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2018)

20. Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

21. Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2020 and the Circular Economy and National Waste Database Report 2021 - 2022

22. US EPA, Characterisation of Building Uses (1998);

23. EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015)

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CHAPTER NINE

LAND & SOILS

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McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

Cork City Council Planning Department. For Inspection Purposes Only!

CHAPTER NINE

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CHAPTER 9 | Land & Soils

9.1 Introduction

This chapter of the EIAR comprises an assessment of the likely significant effects of the proposed development with respect to land, soils, geology, and hydrogeology. The proposed development is located at Ardarostig, Bishopstown, Cork City.

9.2 Expertise & Qualifications

JBA Consulting Engineers and Scientists Ltd (hereafter JBA) has been commissioned to prepare a Land, Soils, Geology and Hydrogeology Assessment for a proposed Large Residential Development at Ardarostig, Bishopstown, Cork.

This chapter of the Environmental Impact Assessment Report (EIAR) was prepared by Conor O'Neil, BSc MSc MCIWEM, and Justin Nangle BSc (Hons) of JBA Consulting Engineers and Scientists Ltd. David has over 10 years' experience as an environmental consultant and has worked on numerous projects involving preparation of Water and Hydrology chapters for Environmental Impact Assessments. Justin has over 2 years' experience as an environmental consultant and has worked on several projects involving preparation of Soils, Geology, Hydrology, and Hydrogeology chapters for Environmental Impact Assessments.

9.3 Proposed Development

A detailed description of the project is provided in Chapter 2. To summarise, the proposed development consists of a Large-Scale Residential Development (LRD) which consists of the construction of 246 no. residential units, a creche and all associated site development works at Ardarostig (Townland), Bishopstown, Cork.

The proposed development will include provision for car parking, including EV charging points, bicycle parking, and motorcycle parking bays. The proposed development will also include the provision of private, communal, and public open spaces; internal roads and pathways with potential for future links to adjacent lands. Included are pedestrian and cyclist cutes; including a permitted path and cycleway also maintaining an existing wayleave, hard and soft landscaping and boundary treatments; waste storage; plant, signage, public lighting and new pumpstation. The proposed residential development will be served by a new public services and infrastructure network to serve the development to be constructed in accordance with all respective current codes of practice.

The wastewater network serving the development will be constructed in accordance with Uisce Eireann standards and connect to the existing wastewater pumping station foul infrastructure being provided as part of the Waterfall Heights Project.

Surface water management will be based on SuDS principles.

The proposed site will be accessed via Waterfall heights on Waterfall Road. A possible future pedestrian/cycle connection is proposed along the north-eastern extents of the site and would connect to the N71, opposite of Dunnes Stores.

9.4 Methodology

9.4.1 Assessment Methodology

The methodology used in this assessment follows current Irish guidance as outlined in:

- Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Department of Housing, Planning and Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- National Roads Authority (NRA) (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- Institute of Geologists of Ireland (2013) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.

In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

In accordance with guidance outlined in the EPA EIA Guidelines (2022) and the IGI Guidance (2013), the following terms are used in the assessment of effects:

- Quality of an effect is described as either Positive, Neutral or Negative.
- Significance of an effect is described as either Imperceptible, Slight, Moderate, Significant, Very Significant or Profound.
- Duration of an effect is described as either Momentary, Brief, Temporary, Short-term, Medium-term, Long-term, Permanent, or Reversible.

In accordance with the IGI guidance (2013), the study area has been set as a 2km radius from the site boundary. This is the recommended minimum distance in the Institute of Geologists of Ireland (IGI) guidelines, and takes into account the lack of karstic or other sensitive subsurface features at the site, and the scale and nature of the development.

9.4.2 Relevant Legislation and Guidance

The EU has set out requirements for Environmental Impact Assessments under the EIA Directive 2011/92/EU (as amended by Directive 2014/52/EU). The principal piece of legislation under which an EIA may be undertaken for developments in Ireland is The Planning and Development Act, 2000 (as amended). Further regulations are explained in the Planning and Development Regulations 2001 (as amended) and European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (as amended).

The legislation relevant to this chapter is listed below. This legislation was consulted during the preparation of this assessment, and the limits contained within them will be used for the purposes of monitoring during construction of the proposed development.

- Water Framework Directive (2000/60/EC);
- Groundwater Directive (2006/118/EC);
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010);

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- European Union Environmental Objectives (Groundwater) (Amendment) Regulations, 2016 (S.I. No. 366 of 2016);
- Waste Management Act 1996, as amended;
- Habitats Directive (92/43/EEC)

In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

In accordance with guidance outlined in the EPA EIA Guidelines (2022) and the IGI Guidance (2013), the following terms are used in the assessment of effects:

- Quality of an effect is described as either Positive, Neutral or Negative.
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- Duration of an effect is described as either Momentary, Brief, Temporary, Short-term, Medium-term, Long-term, Permanent, or Reversible.

In accordance with the IGI guidance (2013), the study area has been set as a 2km radius from the site boundary. This is the recommended minimum distance in the Institute of Geologists of Ireland (IGI) guidelines, and takes into account the lack of karstic or other sensitive subsurface features at the site, and the scale and nature of the development.

9.4.3 Site Surveys/Investigations

A series of Site Investigations were carried out on site by IGSL Geotechnical in June 2025. The site investigation works included:

- 4 no. trial pit excavations;
- Sampling/surveying of trial pits; and
- Laboratory testing.

9.4.3.1 Trial pitting

Trial pitting was undertaken at seven locations across the adjacent site. The trial pits were excavated, logged and sampled under the direction of an IGSL geotechnical engineer.

9.4.3.2 Surveying of Exploratory Hole Locations

Following completion of the exploratory works, surveying was carried out using GPS techniques. Co-ordinates (x, y) were measured to Irish Transverse Mercator and ground levels (z) established to Malin Head.

9.4.3.3 Laboratory testing

Laboratory testing was performed at Eurofins Chemtest Ltd. Soil samples were selected from trial pits for specialist Waste Acceptance Criteria (WAC) analysis and chemical testing including for asbestos and specific pollutants.

9.4.4 Consultation

McCutcheon Halley will be responsible for coordinating the EIAR consultation process, the list of prescribed bodies to be consulted will be agreed with Cork City Council. There are two key stakeholder groups for the subject project: Group 1 – Prescribed bodies and Group 2 – The public. This includes the following groups relevant to this chapter: Environmental Protection Agency, Office of Public Works, Geological Survey Ireland & Uisce Éireann.

9.5 Difficulties Encountered

No specific difficulties were encountered in the preparation of this chapter.

9.6 Description of Existing Environment

9.6.1 Receiving Environment – Site Context

The subject site is located within the extended Cork City development boundary within the Southwestern Suburbs. The subject site is situated approximately 6.1km southwest of Cork City Centre. The site lies to the south of Bandon Road (N71) roundabout and South Ring Road N40.

The land uses on Bandon Road (N71) comprise light industrial uses including car sales show rooms, service stations, and a public storage warehouse. The total site area comprises 5.76 hectares and has a flat topography, there is a total developable area of 4.8 hectares. The site is bounded by the N40 and 4 no. dwellings to the north, light industrial uses to the east, agricultural land to the south and a residential development to the west, which is currently under construction. Access to the proposed development is to the west along Waterfall Road.

The proposed development site is situated within a greenfield plot, other nearby suburban settlements include Ballincollig, approximately 3km to the northwest, Wilton 2.5km to the west and Bishopstown directly to the north. The wider context consists of large suburban landscapes. These consist of residential estates to the north and east. To the west and south, the landscape transitions to a rural setting of agricultural lands, with individual one-off houses and farmyards throughout. Access to the proposed development is to the west along Waterfall Road.

9.6.2 Bedrock Geology

The 1:100,000 GSI bedrock geology map, available on the GSI map viewer (GSI, 2021) was consulted to understand the underlying bedrock geology in the area. The site area is primarily underlain by Sandstone with mudstone and siltstone (Gyleen Formation) on the eastern half with Flaser – bedded sandstone and minor mudstone (Old Head Sandstone Formation) on the northern part of the eastern half. Flaser – bedded sandstone and minor mudstone (Old head Sandstone Formation) is again placed at the southwest portion, and the north – western portion is underlain by Flaser-bedded sandstone and minor mudstone. Refer to Figure 9-1 below.

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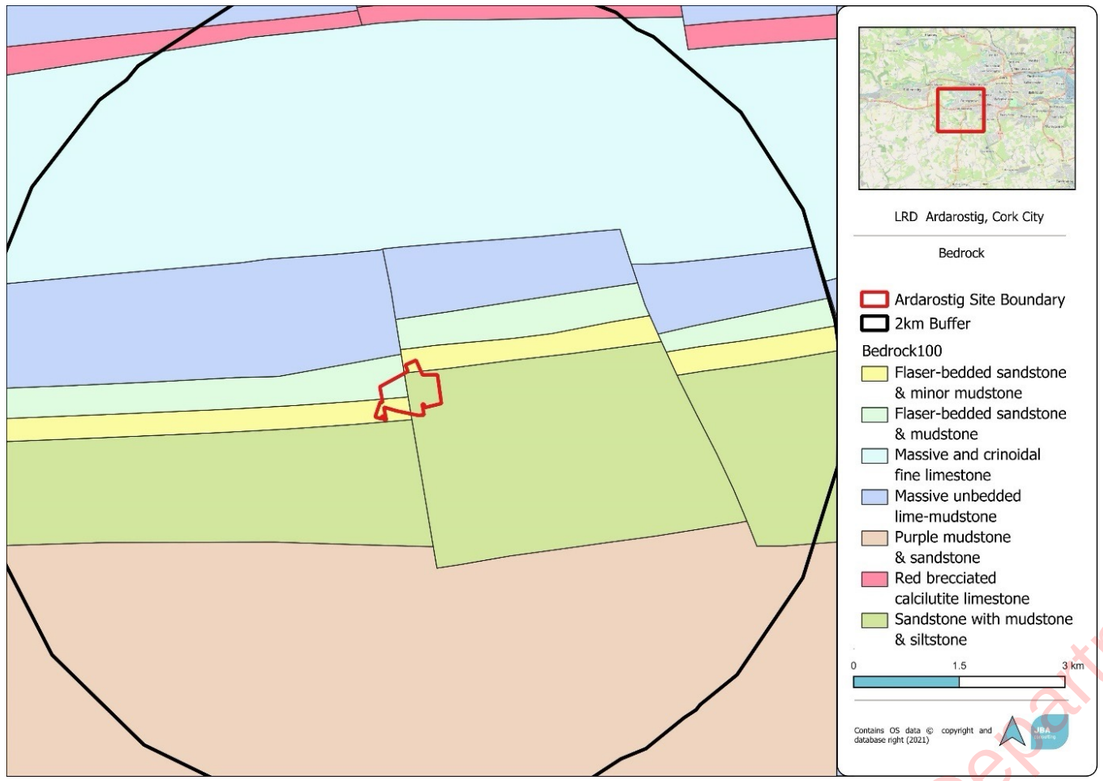


Figure 9.1 Bedrock Geology

9.6.3 Receiving Environment – Site Soils – Irish Soil Information System (SIS) and Quaternary Sediments

The national Irish SIS maps show that the site is underlain primarily by fine loamy drift soils with siliceous stones, and to the north by coarse loamy drift with siliceous stones with Made ground located adjacent to the eastern boundary and 149m to the north, associated with the built-up areas of south – west Cork City.

The quaternary sediments underlying the site are Till derived from Devonian sandstones. Immediately adjacent to the site is urban ground. Beyond the site there is Bedrock at the surface scattered around the surrounding area with the closest 126m to the south – east and 834m to the south. Gravels derived from Devonian sandstones are located 661m west adjacent to the Curraheen Estate.

9.6.4 Karst

The GSI map viewer (GSI, 2021) provides valuable information on the location of Karst features in the study area. Review of the web-portal revealed there is 1 karst feature within the 2km study area. This is a spring with Karst Feature Unique ID - IE_GSI_Karst_40K_3744, located 1.5 km to the west of the site adjacent to the N40 across the road from Cork City FC/ FC Chathair Chorcaí.

9.6.5 Geo-Hazards

According to the GSI map viewer (GSI, 2021), there are no geo-hazards (Landslides) at the site within the 2km study area. The closest site with event ID - GSI_LS12-0327 is located 7.1km to the southeast.

9.6.6 EPA Licensed Facilities and Waste Facilities

Ballincollig (new) Wastewater Treatment Plant (WWTP) (Reg. No. D0049-01) is located approx. 4.9 km northwest of the proposed site, located adjacent to Ballincollig GAA. Based on Uisce Éireann's (UE) 2023 Annual Environmental Report, the WWTP has a capacity of Population Equivalent (PE) 33,000, while the current PE of its area is 23,836.

The closest EPA licenced Facility in the vicinity of the proposed development (e.g., waste facilities, Industrial Emissions Licensing (IEL), or Integrated Pollution Control (IPC) sites). is, Materials Recovery & Transfer Facility, Forge Hill, Kinsale Road, Ballycurreen, Cork located approx. 3km to the east.

9.6.7 Quarries and Mines

The Extractive Industry Register (www.epa.ie) and the GSI mineral database (www.gsi.ie) were consulted to identify any historic/existing mineral sites within the study area. Review of the stated databases confirmed there are no mines are located at the site or within the 2km study area. The nearest active quarry is located in the Ballygarvan area 7.4km to the south-west. Comments regarding the site are; excavator, tractor and trailer, rock breaker, blasting, crushing, dry screening, grading, fixed plant, mobile plant.

There are three mineral localities in the vicinity of the site, the closest mineral locality is malachite, with a metallic description with Large blocks of brown sandstone with malachite and is noted OSI 6" map approx. 1km to the south in Roachfordstown. A second mineral locality of malachite with a metallic description and is located approx. 1.1km to the south-west in Roachfordstown townland, regarding the site are good specimens of malachite found lying loose on the railway line here. Noted on old GSI 6in. map. A third malachite site is located approx. 1.8km to the south-west the description is metallic, comments regarding the site are; large blocks of brown sandstone with malachite noted on old GSI 6in. map here.

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9.6.8 Geological Heritage

No Geological Heritage Sites are in the vicinity of the proposed development. The closest is an audited site located at the Ballygarvan quarry approx. 7.4km to the south-west.

9.6.9 Designated Ecological Sites

Several sites designated under the EU Habitats and Birds Directives, known collectively as Natura 2000 sites, as well as those under the Wildlife Act, are close to the proposed development. These sites have been assessed in the Biodiversity Chapter of this EIAR.

Cork Harbour Special Protection Area (SPA) is approx. 6.5km to the east of the proposed development. The SPA is designated for numerous protected bird species. Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl.

The Great Island Channel Special Area of Conservation (SAC) is located approx. 13.6 km to the east and has designated Mudflats and sandflats not covered by seawater at low tide, additionally Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Douglas River Estuary is currently a proposed Natural Heritage Area (pNHA) is approx. 6.5km to the east of the proposed development.

9.6.10 Regional Hydrogeology

9.6.10.1 Groundwater

The proposed site is located within the Ballinhassig East (IE_SW_G_004) groundwater body. The waterbody was classified as Good status for the most recent Water Framework Directive reporting period (2016-2021) and is Not at Risk.

There are no groundwater monitoring sites in the vicinity for Group Water Schemes, Public Water Supplies, Regional Water Supply Schemes, or Source Protection Zones, nor are there any Group Water Scheme abstraction sites.

Groundwater vulnerability at the site is classed as extreme. Groundwater vulnerability at the site is shown in Figure 9-2 over page.

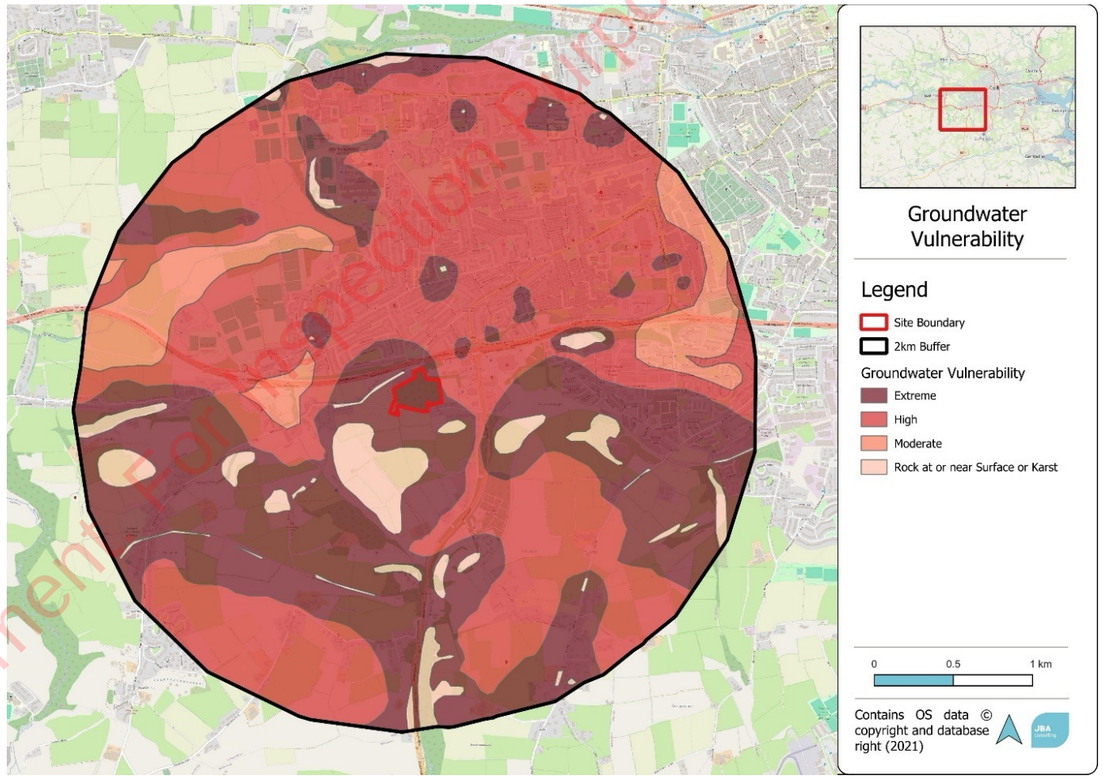


Figure 9.2 Groundwater vulnerability within 2km of the site

9.6.10.2 Aquifer

According to the GSI map viewer, the bedrock aquifer underlying the site is of local importance, being moderately productive only in local zones. Approximately 50m north of the site is an aquifer that is classified as a regionally important aquifer – Karstified (diffuse).

9.6.10.3 Groundwater Extractions

There is one known groundwater extraction on the site area and many in the immediate area.

The GSI groundwater wells and springs register was consulted. This shows all registered groundwater abstractions which are above 25m^3 per day, with grid locations rounded to the nearest kilometre (for privacy reasons). There is a registered groundwater abstraction on site; unique well ID IE_GSI_GW_Well_3569, well name 1405NEW05, Depth of hole is 36m and source yield is 27.30m^3/day. This is within the 2km study area (plus 1km to account for grid location rounding).

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9.6.10.4 Site Environment

Site Investigations were carried out by IGSL in June 2025. The site investigation identified that generally, topsoil is 500mm thick and overlays mixed glacial deposits. The following section contains; Landfill Waste Acceptance Criteria (WAC) analysis (Table 9-1).

Landfill Waste Acceptance Criteria (WAC) analysis was carried out by Eurofins (UK) on soil samples taken by Priority Geotechnical. No elevated levels of contaminants were found in the test samples, and all samples were classified for inert waste landfill. A summary of the single stage WAC results is shown in Table 9-1 below and the full factual report is shown in Appendix 9.1 of this EIAR.

Table 9.1 Summary of the single stage WAC results.

Determinand	TP01	TP02	TP03	TP04	WAC Limits – Inert Waste Landfill
Total Organic Carbon	<0.20	0.23	<20	0.79	3
Loss on ignition	1.7	2.1	2.2	3.3	-
Total BTEX	<0.010	<0.010	<0.010	<0.010	6
Total PCBs	<0.0010	<0.0010	<0.05	<0.05	1
TPH Total WAC	<10	<10	<10	<10	500
Total (of 17) PAHs	< 1.0	<1.0	<1.0	<1.0	100
pH at 20C	8.3	8.0	7.8	6.6	-
Acid Neutralisation Capacity	0.0020	<0.0020	0.0020	<0.0020	-
Arsenic	0.020	0.014	0.029	0.0028	0.5
Barium	0.061	0.053	<0.090	0.067	20
Cadmium	<0.00011	<0.0011	<0.0011	<0.0011	0.04
Chromium	0.023	0.020	0.035	<0.0050	0.5
Copper	0.030	0.025	0.046	0.012	2
Mercury	<0.00050	<0.00050	<0.00050	<0.00050	0.01
Molybdenum	<0.0020	<0.0020	<0.0020	0.037	0.5
Nickel	<0.013	0.017	<0.029	<0.0050	0.4
Lead	0.025	<0.018	<0.045	<0.0050	0.5
Antimony	<0.0005	<0.0050	<0.0050	<0.0050	0.06
Selenium	<0.0050	<0.0050	<0.0050	<0.0050	0.1
Zinc	0.14	0.10	0.19	0.096	4
Chloride	<1.0	<10	16	<10	800
Fluoride	0.15	<10	<1.0	1.8	10
Sulphate	18	13	<10	36	1000
Total Dissolved Solids	110	90	89	500	4000
Phenol Index	<0.30	<0.30	<0.30	<0.30	1
Dissolved Organic Carbon	2.9	<50	<50	<50	500

Soil analysis testing was also carried out, the results of which are contained in Appendix 9.1. The testing showed that no asbestos was detected in the samples taken.

9.7 Characteristics of the Proposed Development

9.7.1 Surface Water

The proposed surface water management system for the proposed development has been designed in accordance with the principles of Sustainable Drainage Systems (SuDS). Surface water will attenuate to 4 no. attenuation tanks, which provide greater capacity than the equivalent 100-year return period storm event. The attenuation outflows will be fitted with flow control devices which will limit discharge to the pre-development greenfield runoff rate.

The SuDS strategy includes a combination of measures such as permeable surfacing to parking spaces, permeable paving to private driveways and reinforced grass to spaces outside private curtilages. Filter strip collection channels underlined with perforated piping, allowing for reduces flow through the pipe to discharge downstream.

The proposed drainage layout and location of SuDS features is shown in the drawing “Proposed Surfacewater Layout” by OSL – Buttler Consulting Engineers.

9.7.2 Foul Water

A dedicated foul system has been provided as part of the proposed development. The design of this system is in accordance with the relevant guidelines and is shown on the drawings prepared by OSL – Buttler Consulting Engineers. The foul system and surface water system are separate.

A Statement of Design Acceptance from Uisce Éireann will be submitted as part of the application.

9.8 Predicted Effects of the Proposed Development

9.8.1 Construction Phase

Construction activities pose a significant risk to land and soils, particularly to hydrogeological receptors such as groundwater bodies and aquifers. The sections below outline the potential effects during construction on land and soils without any mitigation. Mitigation measures are discussed in Section 9.9.

9.8.1.1 Excavation

During construction, some material will be excavated. Part of this material will be reused as fill on-site with the remainder to be deposited across adjoining lands within the client’s ownership. The contractor can also apply to the EPA for an Article 27 derogation for the material to allow it to be used elsewhere on another site as a byproduct, further reducing the effects of its removal. As a worst-case scenario, and if low levels of contamination were detected in the soil, the contactor could send the material to an EPA-licensed soil recovery facility provided the levels of contaminants are below the soil trigger values for the recovery facility.

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If required by condition imposed by the local authority, topsoil stripping associated with the proposed development will be monitored by a suitably qualified archaeologist, which will ensure the identification of any small archaeological features that may survive within the site.

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip and exposure of subsoil will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will also be located so as not to necessitate double handling.

Disturbed subsoil layers will be stabilized as soon as practicable. The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.

The effects of the proposed development on the topsoil are **slight, negative, long-term**, hence the overall significance is slight. No mitigation measures are proposed other than those proposed as part of the construction methodology, i.e., rapid vegetation or covering of topsoil stockpiles to reduce erosion potential.

9.8.1.2 Accidental Spills and Leaks

During construction of the development, there is a risk of localised accidental pollution incidences from the following sources:

- Spillages or leakage of temporary oils and fuels stored on site;
- Spillages or leakage of oils and fuels from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site; and
- Run-off from concrete and cement during the construction of flood walls.

Accidental spillages would result in localised contamination of surface and groundwater underlying the site should contaminants migrate through the subsoils and impact underlying groundwater.

Any soil stripping and foundation construction will further reduce the thickness of subsoils and the natural protection they provide to the underlying aquifer. Concrete is highly alkaline and any spillages which migrate through subsoil can be detrimental to groundwater quality.

The potential impacts could derive from accidental spillage of fuels, oils, paints and solvents, which could impact groundwater quality or soil quality if allowed to infiltrate to ground. The potential impact from accidental spills and leaks during construction, with no mitigation in place, would be **moderate, negative, and temporary**.

9.8.1.3 Import of Soil

The importation of landscaping material may introduce contamination to the site if sourced from inadequate facilities. Responsible sourcing will ensure this impact does not arise. Clean soil will be imported to the site, and the contractor will be required to source the soil from areas that are free of invasive species, i.e., containing no Japanese Knotweed seed or legumes. If soil is imported from an unsafe source, contamination could lead to **moderate negative** impacts.

9.8.2 Operational Phase

Removal of soils and construction of the buildings extended areas could reduce the groundwater recharge slightly. However, the proposed development retains a significant amount of green space through which water can percolate to ground. As such the reduction of the groundwater recharge will not be significant.

Limited land take will occur as a result of the proposed development. The land to be built on is currently in use for agriculture but is zoned for residential use in the City Development Plan. While there will be land take for the proposed development, there is sufficient agricultural land in the surrounding areas, and the site is zoned appropriately. There will therefore be a long-term, not significant negative effect on land take.

The potential effect on land and soils during operation is **long term, imperceptible, with a neutral effect on quality** i.e., an effect capable of measurement but without noticeable consequences.

9.8.3 'Do Nothing' Scenario

In the event of the proposed development not being constructed, there would be no resulting impacts on land and soils at the site, and the site would continue in use for agriculture. The existing land use and subsoil environment at the site would remain in place. The Do-Nothing effect would be **long-term, not significant, neutral** with regard to land and soils.

9.9 Mitigation Measures

9.9.1 Construction Phase

An Outline Construction Environmental Management Plan (OCEMP) has been written by OSL – Buttler Consulting Engineers for the proposed development. The OCEMP will assist the contractor in preventing, minimising, or managing environmental effects during the construction phase of the development. The OCEMP was designed in accordance with standard best practice guidance outlined in the following:

- Control of Water Pollution from construction Sites, Guidance for consultants and contractors (C532);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016); and
- Environmental Good Practice on Site (3rd edition) (C692).

The CEMP also includes site-specific measures to mitigate potential effects on land and soils, including groundwater. These are outlined below.

9.9.1.1 Chemical Pollution

Although the proposed excavation works will temporarily increase the vulnerability of the underlying aquifer, the thickness of the low permeability subsoil and the shallow depths of excavation involved will minimise the risk to groundwater.

Mitigation measures for the protection of groundwater and soils from chemical pollution involve environmental operating plans, chemical storage, and Emergency Response Procedures.

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At construction stage, the following mitigation measures are proposed:

- The measures proposed to be put in place to mitigate any potential damage from the effluent of contaminated ground water will be to create an exclusion zone.
- Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site.
- Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- Any lubricants or hydraulic oils will be bunded in bunds that can contain 110% volume of the largest container. Absorbent pig bags will be kept in the site offices. These will be disposed of correctly if used and replaced with new ones immediately. Disposal records for used adsorbent will be retained by the Site Manager;
- All materials taken on-site will be clearly labelled and stored in sealable containers;
- The diesel fuel tank will be adequately bunded (110%) and the filling nozzle will be stored within the bunded area. The Site Manager will as part of their daily site walkaround check the integrity of the fuel tank(s). The condition of the tanks will be recorded by the Site Manager;
- Re-fuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area which will be away from any existing surface water drains which could also provide pathways to the underlying geology;
- The contractor will ensure that no hazardous or noxious materials enter a watercourse or drain or open excavation. Should this situation arise emergency procedures will be activated;
- During all works the weather forecast will be monitored and a contingency plan developed to prevent damage or pollution during extreme weather. Machinery and equipment will not be left on-site during such events and will be removed beforehand;
- Trucks delivering concrete to the site will not be allowed to washout their vehicles on site. Only washing of the chute will be allowed. The washing facilities will be remote from watercourses and will be bunded by a low earthen berm.
- The Contractor is to clean equipment prior to delivery to the site. The Contractor is to avoid using any equipment which leaks fuel, hydraulic oil or lubricant. The Contractor is to maintain equipment to ensure efficiency and to minimise emissions;
- Should mobilisation of soil particles/pollution be noted in the course of weekly monitoring by the Site Manager, works will stop temporarily, and the Site Manager will initiate the interception and treatment of pollution/silt run-off;
- Precast elements should be maximised to avoid wet concreting in close proximity to water.

9.9.1.2 Silt and suspended solids

There is a risk that ground water could become contaminated with lime from cement which subsequently finds its way into the local adjacent watercourses. Mitigation measures for the protection of groundwater quality from silt and suspended solids on site involve silt control, particularly at any drains or open excavations.

At construction stage, the following mitigation measures will be implemented:

- Discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete.
- Surface water runoff will be collected, a temporary positive drainage system shall be installed prior to the commencement of the construction works
- A series of geotextile lined cascading, high level outfall, settling basins will be installed upstream of the agreed discharge point by the appointed contractor.
- Alternatively, a 'siltbuster' silt control unit can be used on the outfall. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed before water is discharged in a controlled manner to the agreed outfall.
- All inlets to the cascading settling basins will be riprapped to prevent scour and erosion in the vicinity of the inlet. There will be:
  - » Minimisation of site disturbance
  - » Implementation of sediment control (as outlined above)
  - » Minimisation of the potential for erosion
  - » Prevention of sediment-contaminated water leaving the site
- All soil stockpiles will be covered (vegetated or with tarpaulins/similar material) to minimise the risk of rain runoff/ wind erosion. Vegetation will be established as soon as possible on all exposed soils.

9.9.1.3 Import and Export of Soil

Fill material will be tested and imported from a licensed facility to ensure no external contamination is introduced to the soil and geological environment.

The contractor will be required to carry out a waste characterisation of the material that will be taken off site for disposal. A waste acceptance criteria (WAC) analysis and asbestos levels should be determined on any material that will be taken off site for disposal. WAC analysis and asbestos testing was carried out during Site Investigations by Priority Geotechnical; no asbestos was detected, and the samples were classified as being suitable for inert landfill disposal. The acceptance of material at a licenced soil recovery facility will be subject to the approval of the facility operator.

9.9.2 Operational Phase

No significant effects are anticipated during the operational phase. Therefore, no mitigation measures have been proposed.

9.10 Predicted Effect of the Proposed Development Post-Mitigation

9.10.1 Construction Phase

Following implementation of the proposed mitigation measures, the residual effects of the proposed development on land, soils, and hydrogeology will be minimised.

Following the implementation of the mitigation measures, the effects during the construction phase will be **short-term, slight, negative**, reducing to **imperceptible** over time.

9.10.2 Operational Phase

The design of the scheme has been such that there are no predicted effects on the water and hydrogeological environment during the operational phase of the development.

Overall, the long-term effects of the proposed development will be **neutral and imperceptible.**

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9.11 Monitoring

9.11.1 Construction Phase

- During the construction phase, a monitoring programme will include daily checks, weekly inspections and monthly audits
- Appropriate monitoring of groundwater levels during site works shall be undertaken. Standard construction phase filtering of surface water for suspended solids will be carried out.
- A dust deposition monitoring programme will be implemented during the Construction Phase to include; Regular watering of stockpiles during dry and windy periods.
- A noise and vibration monitoring specialist will be appointed to periodically carry out independent monitoring of noise and vibration at sensitive locations for comparison with limits and background levels, also which vibrations potentially could cause vibration impact to buildings will be in use.
- Only an approved storage system for oil / diesel within the site will be permitted. Oil and diesel storage will be located within a designated area and placed furthest away from adjacent watercourses and contained within constructed bunded areas.
- The bunded area will accommodate the relevant oil / diesel storage capacity in case of accidental spillage.
- Any accidental spillages will be dealt with immediately on site however minor by containment /removal form site
- Surface water runoff from this bunded hardstanding area will discharge to a drain via a full retention petrol interceptor or to the on-site WWTP.

If the mitigation measures in place during construction are observed to be insufficient or inefficient (i.e., elevated suspended solids, pH, conductivity, chemical oxygen demand, or total petroleum hydrocarbons are detected during monitoring prior to discharge), the discharge will be halted, and the mitigation measures will be revised and reimplemented. Further sampling will verify the success of the revised/updated surface water management. The affected water will be conveyed to the revised/updated treatment train and put through a hydrocarbon interceptor and settlement tanks to ensure compliance with the required levels in the treated water.

9.11.2 Operational Phase

No operational phase monitoring is required for land and soils.

9.12 Interactions and Cumulative Effects

9.12.1 Interactions

The EIAR must also consider in-combination effects, or the interactions between the different factors discussed.

Surface water effects are directly linked with hydrogeology or groundwater effects, with surface water pathways leading to groundwater and vice versa. Surface water runoff can also have an effect on soil quality in the area, with chemicals or suspended solids having an effect on soil fertility and contamination. These effects are further discussed in the Hydrology Chapter 10 of this EIAR. Without mitigation measures, the interaction of these two elements could lead to a short-term significant negative effect. With the proposed mitigation measures outlined in this chapter and in Chapter 17 of the EIAR, the potential interaction between these is reduced to a short-term, imperceptible, neutral effect.

The removal of material from the site will require vehicles using the road network in the area. Chapter 6 of the EIAR concludes that no significant effects are anticipated from traffic and transport during the demolition and construction phases. The CEMP also contains mitigation measures for the movement of vehicles, which when implemented will ensure that effects are further reduced. The interaction of these with land and soils will be temporary, imperceptible, neutral.

Interactions with biodiversity can occur through the spread of hazardous materials or contaminated land during construction. The spread of materials found in the soils (trace amounts of asbestos, lead, or hydrocarbons) could lead to habitat degradation, either on site or downstream through groundwater pathways. With the implementation of mitigation measures outlined in this chapter and Chapter 11 of the EIAR, and in the CEMP, interactions between biodiversity and land and soils will be short-term, imperceptible, neutral.

The material assets on site (surface and stormwater drainage) are assessed in Chapter 7. These have been designed in accordance with SUDS and the Greater Dublin Strategic Drainage Study. The potential for effects on groundwater from these assets has been assessed in this chapter. Any interaction between material assets and land and soils will be long-term, imperceptible, neutral.

9.12.2 Potential Cumulative Effects

Cumulative effects are the result of several minor effects combining to create a more significant effect. The assessment of cumulative effects considers existing stresses on land, soils, and groundwater as well as developments close to this development that are in planning or are underway. All cumulative developments outlined in Chapter 1 have been taken into account.

9.13 References

Cork City Development Plan 2022-2028

DoEHLG & OPW, Planning System and Flood Risk Management Guidelines for Planning Authorities (2009)

EPA, 'Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (2015)

EPA, 'EPA River Quality Surveys: Biological' available at: https://epawebapp.epa.ie/qvalue/webusers/

EPA, 'Guidelines on the Information to be Contained in Environmental Assessment Reports' (2022)

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IGI, 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements', (2013)

OSL Butler Consulting Engineers, 'Engineering Report for Ardarostig Lands, Waterfall, Bishopstown, Cork ' (2025) Revision D, Job No. 24066

OSL Butler Consulting Engineers, 'Outline Construction and Environmental Management Plan, Large-scale Residential Development at Ardarostig, Bishopstown, Cork, (2025)

Uisce Éireann, Annual Environmental Report 2022, Ballincollig New D0049-01 (2023)

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CHAPTER TEN

WATER & HYDROLOGY

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McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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CHAPTER 10 | Water & Hydrology

10.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development for Ardrostig, Cork. It evaluates the likely significant effects, if any, which the Proposed Development will have on hydrology (surface water) and hydrogeology (groundwater).

This chapter contains necessary information as defined in the Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022). Reference is made to geology, but this aspect is covered in more detail in Chapter 5 (Land, Soils and Geology).

The chapter initially provides a description of the receiving environment of the site and the potential impacts of the development. When assessing the potential impacts, this assessment considers the significance of the environmental attributes, and the predicted scale, and duration of the likely effects.

The chapter also outlines the proposed mitigation measures that will reduce or eliminate the identified potential impacts and define the residual effects of the Proposed Overall Development (the effect after the implementation of mitigation measures).

This chapter should be read in conjunction with Chapter 9 (Land, Soils, Geology and Hydrogeology) and Chapter 11 (Biodiversity).

It also should be read in conjunction with Chapter 2 for the EIAR which does into further detail with regards to the site description.

10.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Marcelo Allende and Ana Keeley of AWN Consulting. Marcelo Allende (BSc, BEng) is a Principal Environmental Consultant (Hydrologist) with AWN Consulting with over 20 years of experience in water resources technical studies, conceptual and numerical hydrological/hydrogeological modelling and environmental consultancy. Marcelo holds a degree in Water Resource Civil Engineering (BEng, Hons) from the University of Chile and a Bachelor of Science in Engineering (BSc, Hons). He has worked on a wide of range of projects including multi-aspect environmental investigations, geo-environmental impact assessments, surface and groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, strategic and site specific flood risk assessments (Stage 1,2 and 3), Due Diligence reporting, baselines studies, soils, surface water and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama. He also has detailed knowledge of environmental guidance, legislation, regulations & standards and expertise in GIS (expert level) and MATTE studies at COMAH establishments. He is currently a member of the International Association of Hydrogeologists (IAH, Irish Group) and a member of Engineers Ireland (MIEI).

Ana Keeley is an Environmental Consultant with AWN Consulting with ongoing roles within the water department. Ana has a BSc in GeoScience from Trinity College Dublin. Ana has worked on a range of projects including environmental investigations, environmental impact assessment reports, hydrological risk assessments and ArcGIS mapping. Ana is a member of the International Association of Hydrogeologists (Irish Group).

10.3 Proposed Development

Refer to Chapter 2 for full details of the proposed development.

10.4 Methodology

10.4.1 Criteria for Rating of Effects

The section establishes the criteria, and guidance used to rate the significance of the potential impacts of the Proposed Development project on the hydrological and hydrogeological aspects of the site and surrounding area.

The document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII, 2009, previously NRA) is referenced where the methodology for assessment of impact is appropriate.

Furthermore, in line with this TII Guidelines, an assessment of the attribute importance has been undertaken in order to provide a basis for the assessment of impact provided. The attribute importance considers the potential as well as the existing use of the surface water features as a water resource (i.e., water supply, fisheries and other uses) as well as ecological habitat requirements. The TII criteria for rating the hydrological and hydrogeological related attributes are presented in Appendix 10.1 of this EIAR.

The quality, significance, and duration of the potential impacts, residual effects, and cumulative effects are described using standard EIA descriptive terminology set out in Chapter 1 of this EIAR.

The principal attributes (and effects) to be assessed include the following:

- Water Framework Directive (WFD) Status and potential for increased risk of deterioration of this status due to the activities of the site.
- River and aquifer water quality in the vicinity of the site (where available).
- Surface, transitional and coastal watercourses near the site and potential impact on surface water quality arising from Proposed Development related works including any discharge of surface water run-off.
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and
- Surface water features within the area of the site.
- High-yielding water supply springs/ wells in the vicinity of the site to within a 2km radius and the potential for increased risk presented by the Proposed Development.
- Classification (regionally important, locally important etc) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the Proposed Development e.g. removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality.
- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the site; and,
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporarily.

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10.4.2 Water Framework Directive (WFD) Status

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy; commonly known as the Water Framework Directive (WFD) establishes a framework for community action in the field of water policy.

The WFD requires 'Good Water Status' for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means both 'Good Ecological Status' and 'Good Chemical Status'. In 2009 the first River Basin Management Plan (RBMP) 2009-2015 was published. The second cycle river basin management plan was carried out between 2018-2021 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD). The third cycle river basin management plan namely, The Water Action Plan 2025 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024) is currently in place.

During the development of this Plan, a prioritisation exercise was undertaken by the local authorities, the EPA and other stakeholders to identify those water bodies that require immediate action within this plan cycle to 2021. During the catchment characterisation, the EPA identified those water bodies either 'At Risk' of not achieving their objectives or 'Under Review'. The outcome of this prioritisation process was the selection of 190 Areas for Action across the 5 Local Authority regions. Within these 190 areas, a total of 726 water bodies were selected for initial actions during this RBMP cycle. There are 832 water bodies identified as being 'At Risk' of not achieving their environmental objectives under this Plan that have not been included in the Areas for Action. For most of these water bodies, targeted actions will be undertaken in The Water Action Plan 2025. The Water Action Plan 2025 has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the Proposed Development.

10.4.3 Relevant Legislation & Guidance

As outlined in Chapter 1 the information provided complies with all relevant EU and Irish legislation and includes consideration of the objectives as outlined in the Cork City Development Plan 2022-2028. Relevant legislation includes:

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022).
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII, 2009, previously NRA). The TII criteria for rating the hydrogeological and hydrological related attributes are presented in Appendix 9.1 and 9.2 of this EIAR.
- Water Framework Directive 2000/60/EC.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation, regulations and guidelines. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003).
- European Communities (Drinking Water) Regulations 2023 (S.I. 99 of 2023).
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009 as amended SI No. 77 of 2019).
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 S.I. No. 366 of 2016).
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2022.
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011).
- Statutory Instrument (SI) No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988.
- Local Government (Water Pollution) Acts 1977-2007.
- (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and amendments) and European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and amendments).
- Water Services Guidelines for Planning Authorities Draft (Department of Housing, Planning and Local Government, 2018).
- Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board);
- Central Fisheries Board Channels and Challenges – The enhancement of Salmonid Rivers;
- CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors;
- CIRIA C648 Control of Water Pollution from Constructional Sites;
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA 2008); and
- Inland Fisheries Ireland (IFI) – A Guideline on Planning for Watercourses in the Urban Environment.

10.4.4 Sources of information

Desk-based hydrological information in the vicinity of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Latest EPA Envision water quality monitoring data for watercourses in the area.
- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1:100,000 mapping.
- River Basin Management Plan for Ireland 2022-2027 (Department of Housing, Planning and Local Government, 2018).
- Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW, 2009).
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie).
- Relevant Eastern Catchment Flood Risk Assessment and Management (CFRAM) Flood Reports.
- National Parks and Wildlife Services (NPWS) – Protected Site Register.
- Cork City and County Development Plan 2022-2028 – Strategic Flood Risk Assessment (SFRA, 2023-2029).

Site specific data was derived from the following sources:

- Ballinhassig East GWB: Summary of Initial Characterisation (GSI, 2004)
- OSL Butler Consulting Engineers - Engineering Service Report (2025)
- OSL Butler Consulting Engineers – Drainage Impact Assessment (2025)

10.4.5 Site Surveys/Investigations

No Site Surveys/ Investigations have taken place

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10.5 Difficulties Encountered

There were no difficulties encountered in the preparation of this EIAR

10.6 Baseline Environment

10.6.1 Site Description

The Proposed Site Development is located in Ardarostig, Waterfall Road, Bishopstown, Cork, covering a total area of approximately 5.76 hectares (14.2 acres). It is c. 5km southeast of Cork city centre. The site is located within three joined fields, separated by tree-lined hedgerows. It is bounded to the north by Waterfall Road and the N40, where a mix of residential properties and industrial businesses are located. To the east, the site adjoins further industrial premises, while to the south it is bordered predominantly by greenfield land. To the west lies the Waterfall Heights Residential Scheme.

The topography of the site is relatively uniform, sloping from approximately 35.5mOD in the southern section to around 17.5mOD at the northern boundary. The site at present is a greenfield site unoccupied by any structures or buildings, as shown in Figure 10-2.

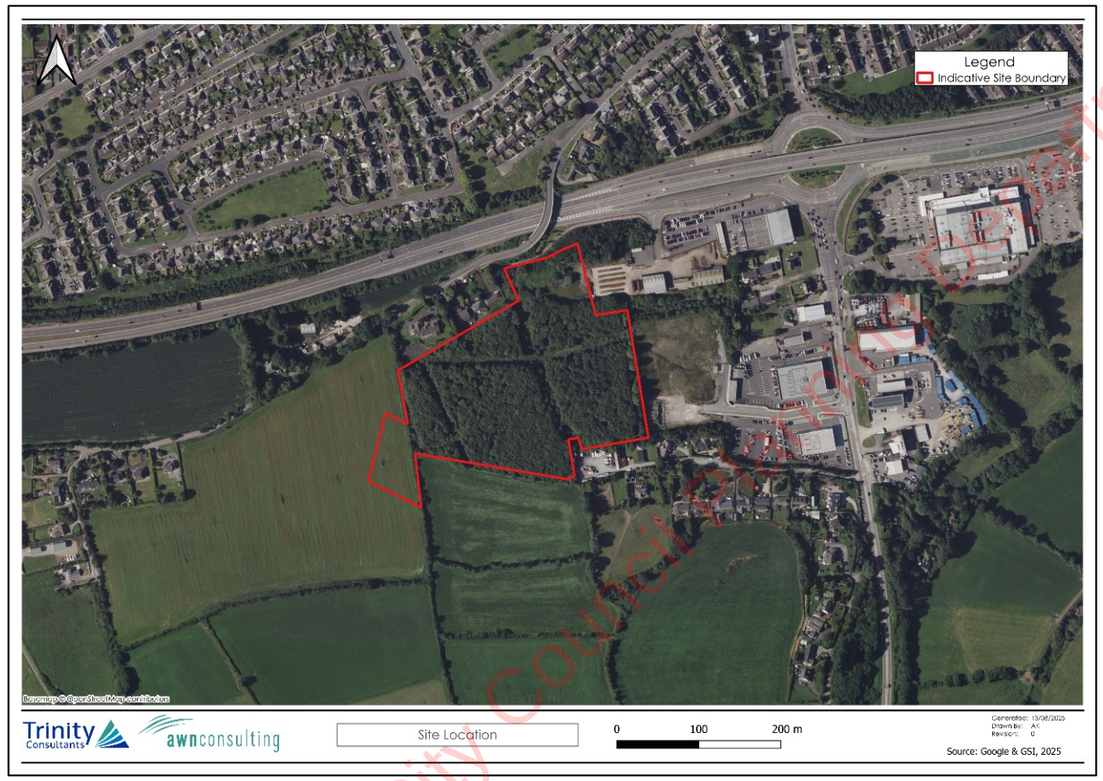


Figure 10.1 Site Location and Surrounding Land Use

10.7 Hydrology

10.7.1.1 Regional Hydrological Environment

The proposed development site is located within the Lee, Cork Harbour and Youghal Bay WFD Catchment (Catchment ID: 19) and the Glasheen [Corkcity]_SC_010 WFD sub-catchment (EPA, 2025). There are three field drains that run parallel to the hedge rows divining each field from each other.

Based on the local topography, it is assumed that these drains flow in a northern direction, potentially discharging into either the Glasheen Stream (EPA Code: IE_SW_19G040700), located c. 150 m east of the proposed development or the Twopot River (EPA Code: IE_SW_19T050890), located c. 450m west of the proposed site. Both waterbodies subsequently discharge into the River Lee.

The Glasheen Stream (EPA Code: IE_SW_19G040700) originates at St. James's Cemetery, Chetwynd, c. 1 km south of the proposed development, and flows in a north-easterly direction. The Twopot River (EPA Code: IE_SW_19T050890) rises within the western grounds of Cork Airport, c. 5.5 km southeast of the proposed development. It flows northwest until it joins the Curragheen River (EPA Code: IE_SW_19C120740) at Bishopstown. The Curragheen River then flows east, running parallel to the River Lee. At Victoria Cross, located c. 3 km north of the proposed development, the Glasheen Stream meets the Curragheen River. At c. 300 m downstream, the Curragheen River enters the River Lee (South Channel) (EPA Code: IE_SW_060_0950) see Figure 10-2.

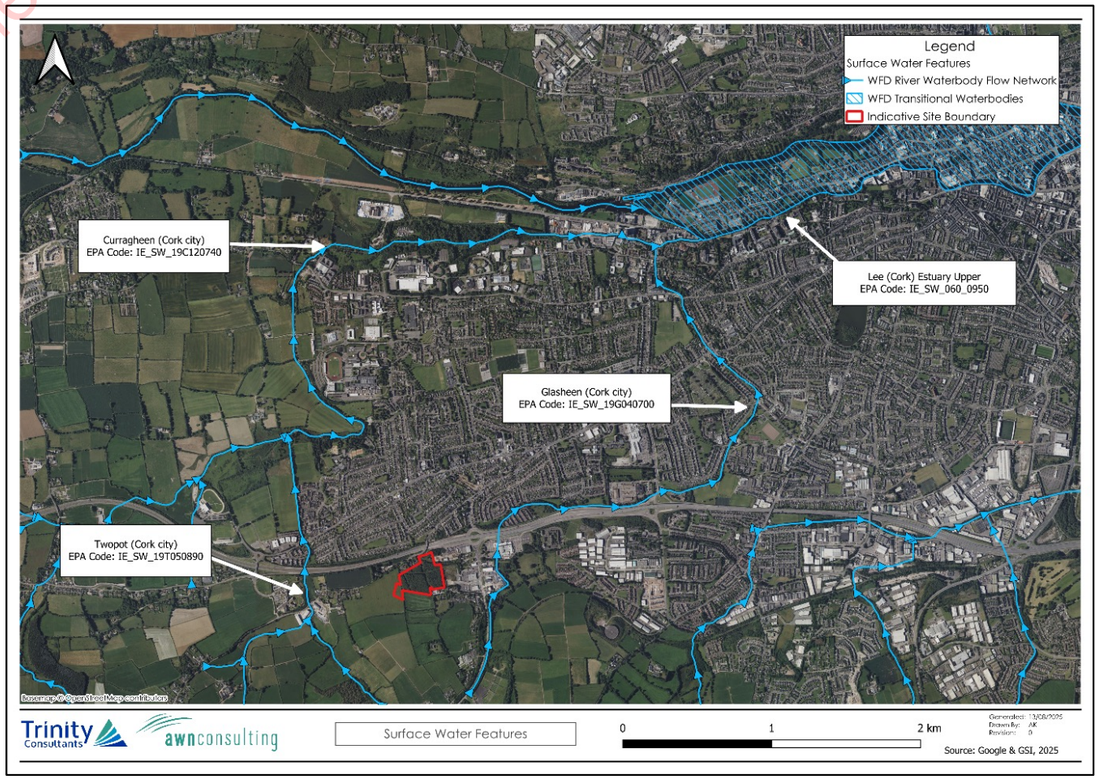


Figure 10.2 Hydrological Environment

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10.7.1.2 Local Hydrological Environment

A hydrological feature is present within the proposed development site in the form of a drainage ditch running along the northern boundary. This ditch flows in a west-to-east direction and discharges into an existing culvert located at the Heiton site entrance (see Figure 10-3). The culvert forms part of the local drainage network, linking the system on the southern side of the N40 to the Glasheen River, located to the north of the site.

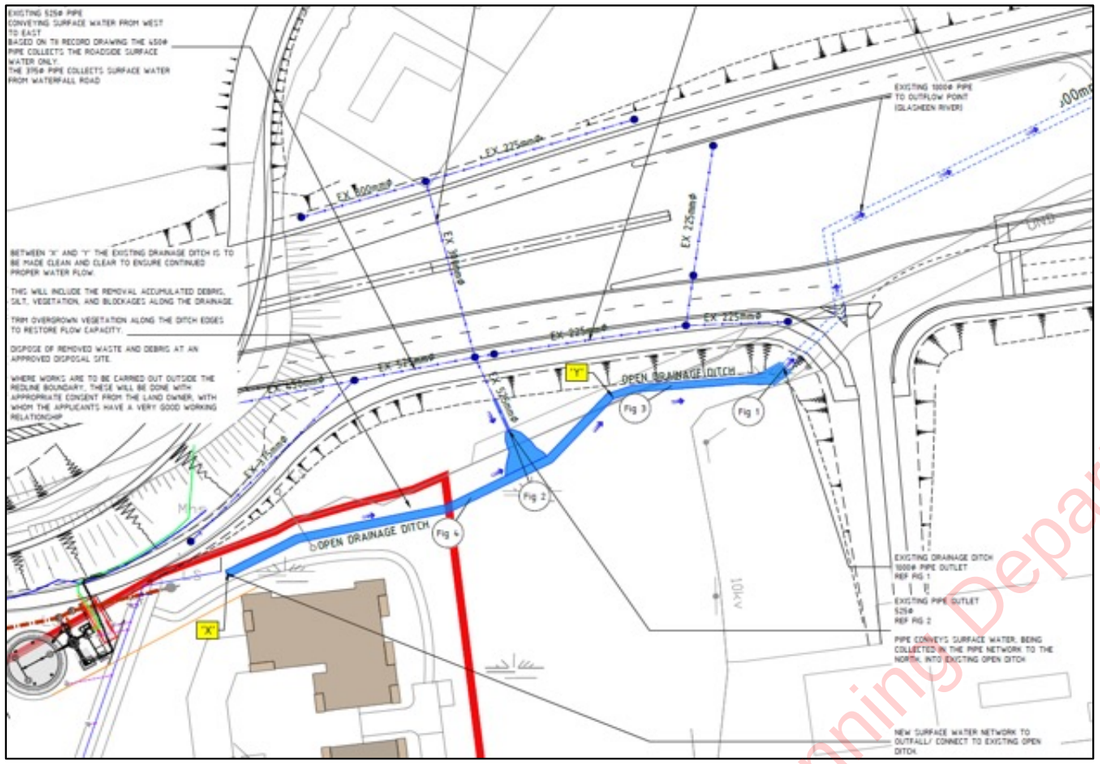


Figure 10.3 Local Hydrological Environment (OSL Butler Consulting Engineers, 2025)

10.7.2 Surface Water Quality

Surface water quality is monitored periodically by the EPA at various regional locations along with principal and other smaller watercourses. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality. In relation to the Proposed Development site, there are no nearby (active) surface waterbody EPA monitoring stations.

Table 10.1 Summary of Surface Water Quality Levels

Q Value	WFD Status	Pollution Status	Condition
Q5, Q4-5	High	Unpolluted	Satisfactory
Q4	Good	Unpolluted	Satisfactory
Q3-4	Moderate	Slightly polluted	Unsatisfactory
Q3, Q2-3	Poor	Moderately polluted	Unsatisfactory
Q2, Q1-2	Bad	Seriously polluted	Unsatisfactory

The EPA also classified water bodies in accordance with the WFD water quality status. Rivers, lakes, estuaries and coastal waters can be awarded one of five statuses: High, Good, Moderate, Poor, Bad. Groundwater has just two statuses – Good and Poor.

According to EPA (2025), Glasheen Stream has a WFD status (2016-2021) of 'Poor' as shown in Figure 10-4 and a WFD risk score of 'Not achieving Good Status' by 2027. This 'Poor' status assigned to the Glasheen Stream is due to its poor biological (invertebrate) status or potential. Both Twopot and Curragheen waterbodies are currently classified a by the EPA as having 'Moderate' WFD water quality status (2016-2021 period) and are 'At risk'. The Lee (Cork) Estuary Upper has a risk score of 'Moderate' as it 'At risk' of not achieving good status. This score is due to its moderate Ecological Status.

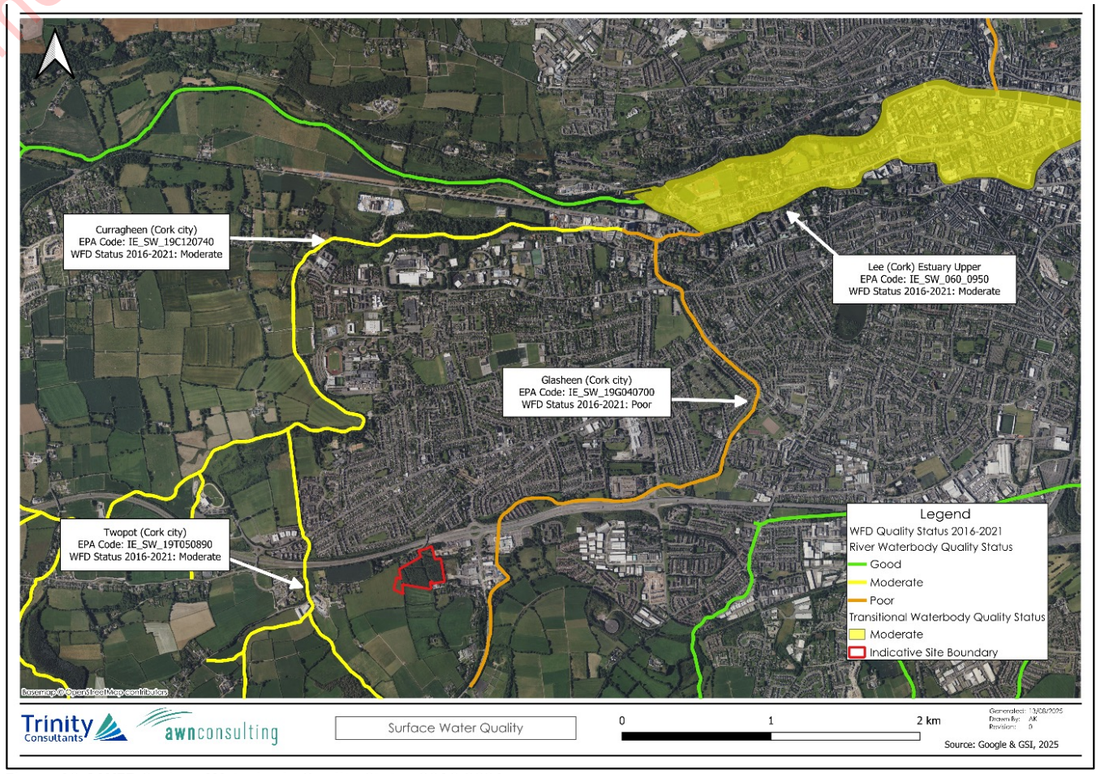


Figure 10.4 WFD Surface Waterbody Quality Status 2016-2021

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10.7.2.1 Surface Water Flows and Levels

Only two active hydrometric (gauging) stations are currently in operation for the waterbodies referenced in Section 10.7.1.1, and both are located downstream of the proposed development site along the Curragheen River. The first, Carrigrohane Bridge (Station No. 19114), is situated approximately 1.6 km north of the site. The second, County Hall (Station No. 19113), lies roughly 2.4 km to the north-east.

Of these, Carrigrohane Bridge is the only station that records surface water flow data. According to available records, the Dry Weather Flow (DWF) for the Curragheen River at this location is 0.147 m^3/s, based on the 95-percentile low flow statistic (i.e., the flow exceeded 95% of the time under baseline conditions or dry weather flow). This value is typically used in environmental assessments to represent low-flow scenarios when assimilative capacity for pollutants is at its most limited. Given that both monitoring points are located downstream, no direct upstream flow data is available for the proposed site.

10.7.3 Bathing Waters and Recreational Waterbodies

The local environment also includes areas of natural resources that relate to populations and human health that may be impacted by the Proposed Development, this includes economic resources, recreational and bathing waters, and drinking water resources.

A review of Environmental Sensitivity Mapping online maps that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has shown that there are no Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA, within the proposed development or located near the Glasheen Stream, Twopot, Curragheen or Lee Rivers.

The nearest Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA to the proposed development is Fountainstown (Bathing Water ID: IESWBWC050_0000_0100) located c.18 km southeast.

10.7.4 Water Supplies

A review of the Environmental Protection Agency (EPA) online mapping, which includes the Register of Protected Areas (RPA) established under the Water Framework Directive (WFD), indicates that there are no Nutrient Sensitive Area within the proposed development. The nearest Nutrient Sensitive Area is the Lee Estuary / Lough Mahon (EPA Code: IE_SW_060_0750), located 5.5km north. These areas are designated in accordance with the Urban Wastewater Treatment (UWWT) Directive (91/271/EEC) and relevant national legislation, including S.I. 254/2001, S.I. 440/2004, and S.I. 48/2010. In this context, the identified waterbody is used to define the extent of the nutrient-sensitive designation.

10.7.5 Existing Water and Wastewater Utilities

There are no existing water or wastewater utilities located within the boundary of the proposed development site or in its immediate surrounding area. The nearest wastewater utilities to the proposed development is Ballygarvan Uisce Éireann (Registration Code: D0540) located 7.3km south of the proposed site.

10.7.6 Surface Water Abstraction

There are no known reported abstractions from surface water in the vicinity of the proposed development (GSI, 2025).

10.7.7 Drainage and Flooding

The EU Floods Directive (2007/60/EC) required Member States to undertake a national preliminary flood risk assessment by 2011 to identify areas where significant flood risk exists or might be considered likely to occur. Members States were also required to prepare catchment-based Flood Risk Management Plans by 2018 that will set out flood risk management objectives, actions and measures. The OPW in co-operation with various Local Authorities produced a number of PFRAs which aimed to map out current and possible future flood risk areas and develop risk assessment plans. As part of the CFRAM programme provisional flood maps had been produced by the OPW which have been used in this assessment.

There are no recorded past flood events within the vicinity of the proposed site development. However, it does record instances of historic flooding in close proximity to the site. Recurring flooding has been reported to the northwest of the site when the Curraheen River overtops its banks. Additionally, the Twopot River caused historical fluvial flooding in 2012, impacting the University Technology Park 1.5km to the northwest of the proposed site in Curragheen. There was also flooding of the Dunnes Stores car park to the east of the site in 2012, following fluvial flooding of the adjacent Glasheen River in 2009.

According to Flood maps available online (OPW, 2025), there is probability of flooding along the Curraheen River and Twopot River.

However, according to the Flood Risk Assessment undertaken by OSL (2025), the proposed development, including all proposed residential dwellings, is located within Flood Zone C as defined by the requirements of "The Planning System and Flood Risk Management, Guidelines for Planning Authorities", i.e., outside of the Low Probability flood plain (1:1000-year or 0.1% AEP). The probability of flooding along the Curragheen River and Twopot River are presented in Figure 10-5 below.

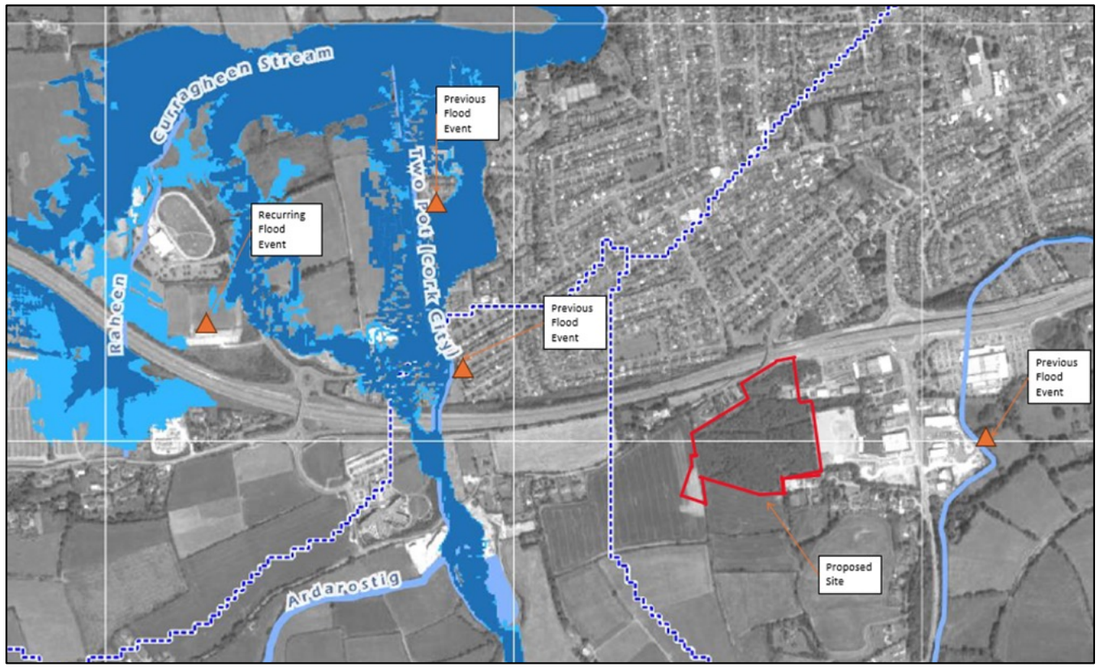


Figure 10.5 Flood Risk Assessment (OSL Butler Consulting Engineers, 2025)

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10.7.8 Designated Areas

The NPWS (2025) on-line database have been reviewed to determine the location of areas of conservation within the Proposed Development site, and there are no Special Protected Areas (SPA) established under the EU Birds Directive (79/409/EEC), or Special Areas of Conservation (SAC) established under the Habitats Directive within the boundary of the Proposed Development site. Furthermore, there are no Natural Heritage Areas (NHA), or proposed Natural Heritage Areas (pNHA) established under the Wildlife Acts, 1976 and 2000 (as amended) within the boundary of the Proposed Development site. The European sites and pNHA in closest proximity to the Proposed Development are as follows:

- Cork Lough pNHA (Site Code: 001081) c. 3km northeast.
- Cork Harbour SPA (Site Code 004030) c. 9km northeast;
- Lee Valley pNHA (Site Code 000094) c. 2.4km north;
- Douglas River Estuary pNHA (Site Code 001046) c. 6.2km east

According to NPWS (2025), there are no NPWS protected areas in the vicinity of the Proposed Development site. The nearest Natura 2000 Site is Cork Harbour SPA (Site code: 004030) located circa 9 km northeast of the proposed development as shown in Figure 10-6. The development site has a hydrological connection with this SAC as Glasheen Stream, Curragheen and Twopot Rivers drain into the Lee Estuary Upper (EPA Code: IE_SW_060_0950) which eventually joins Cork Harbour SPA.

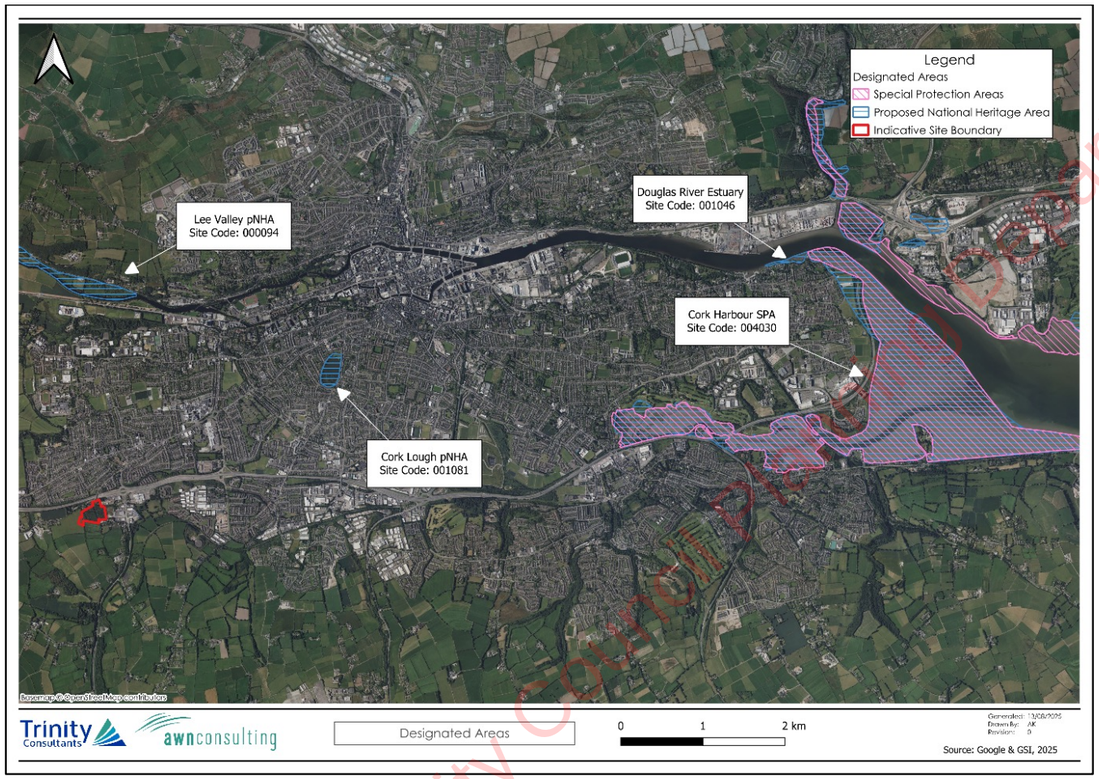


Figure 10.6 Designated Areas

10.7.9 Rating of Importance of Hydrological Attributes

Based on the TII methodology (2009) (See Appendix 10.1) the importance of the hydrological features at this site is rated as 'Low' importance based on the assessment that the attribute has a low-quality significance or value on a local scale, based on the fact that it is not an area of water supply, within a flood zone or an amenity area.

10.8 Hydrogeology

10.8.1 Aquifer Classification

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km2), well yield (m3/d), specific capacity (m3/d/m) and groundwater transmissivity (mm3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

The GSI (2025) classifies the principal aquifer types in Ireland as:

Bedrock Aquifer

- Rkc – Regionally Important Aquifer – Karstified (conduit)
- Rkd – Regionally Important Aquifer – Karstified (diffuse)
- RK – Regionally Important Aquifer – Karstified
- Rf – Regionally Important Aquifer – Fissured bedrock
- Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive
- Lk – Locally Important Aquifer – Karstified
- Ll – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones
- Pl – Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones
- PU – Poor Aquifer – Bedrock which is Generally Unproductive

Gravel Aquifer

- Lg - Locally Important Aquifer - Sand & Gravel
- Rg - Regionally Important Aquifer - Sand & Gravel

According to GSI (2025), the bedrock aquifer underlying the site as a Locally Important Aquifer (Ll), i.e. Bedrock which is Moderately Productive only in Local Zones as presented in Figure 10-7. The potential for local vertical or horizontal migration within this type of aquifer is moderate depending on the area but may not have extensive regional connectivity. As such the aquifer is not a significant pathway for off-site migration.

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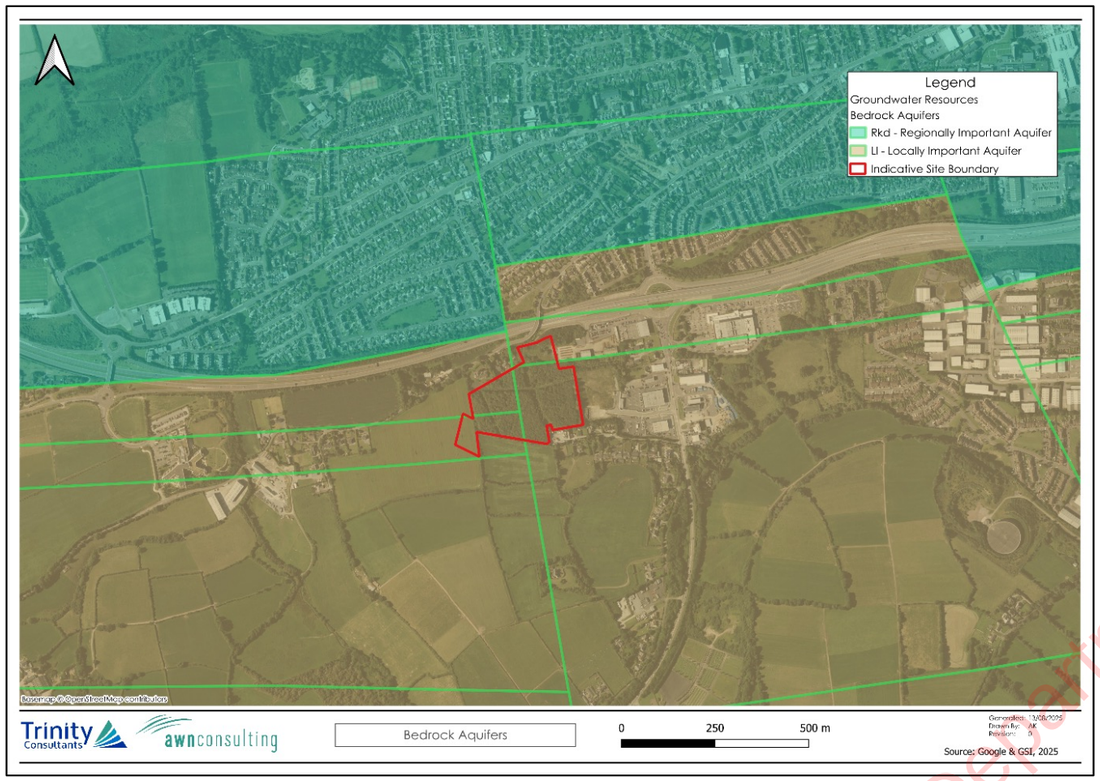


Figure 10.7 Aquifer Classification

The site is underlain by the Ballinhassig East groundwater body (GWB) (European Code: IE_SW_G_004), which has been investigated by the GSI, it is underlain predominantly by Devonian Old Red Sandstone (DORS) formations and Dinantian mudstones and sandstones of the Cork Group. These rocks are generally of low matrix permeability, with groundwater movement occurring primarily through fractures, joints, and fault zones. Quaternary deposits, including glacial tills, glaciofluvial sands and gravels, and alluvium, occur locally and can provide zones of higher permeability. Structural deformation from Variscan folding and faulting has created localised areas of enhanced transmissivity, although overall aquifer productivity remains modest.

Transmissivity across the groundwater body is typically low, yields are generally low to moderate and are highly variable depending on whether boreholes intersect more transmissive fracture zones or sand/gravel deposits. Groundwater recharge is diffuse and is estimated at approximately 200 mm/year, limited in areas where low-permeability tills or thick subsoils restrict percolation to bedrock. Where more permeable subsoils are present, recharge is more effective, resulting in locally higher water table elevations and more sustained baseflows to surface waters.

Groundwater movement within the GWB is shallow and structurally controlled, with flow paths largely confined to weathered bedrock and fault-related zones. The groundwater regime is closely connected to the surface water network, with local discharge to streams, springs, and low-lying alluvial deposits. Flow directions are controlled by topography and geological structures, and the aquifer exhibits significant spatial heterogeneity in permeability. Although the GWB does not represent a major regional water resource, locally productive zones can sustain modest abstractions where fracture connectivity or sand/gravel bodies are present. The shallow and locally permeable nature of the aquifer, particularly where subsoils are thin, results in areas of high vulnerability to contamination, warranting appropriate source protection measures in development planning (GSI, 2004).

In addition, there are no groundwater source protection zones, which are zones defined by the GSI within which development is limited in order to protect drinking water supplies from potential pollution, located within the Proposed Development site or in the immediate vicinity.

10.9 Aquifer Vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from potential contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of or of mixtures of peat, sand, gravel, glacial till, clays or silts).

Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is also associated with karst landforms as these are a direct pathway for water and contaminants to enter the aquifer from the surface.

According to GSI regional mapping, the groundwater vulnerability rating is classified as 'Extreme' Vulnerability - Groundwater here has natural characteristics that make it extremely vulnerable to contamination by human activities for the proposed development as shown in Figure 10-8 (GSI, 2025). Aquifer vulnerability classifications are primarily based on the permeability and thickness of subsoils. Refer to Table 10.2 below.

Table 10.2 Summary of Aquifer Vulnerability Classifications

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. Clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	> 3.0m	3.0 - 10.0m	3.0 - 5.0m	> 3.0m	N/A
Moderate (M)	N/A	> 10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	> 10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
(2) Precise permeability values cannot be given at present.
(3) Release point of contaminants is assumed to be 1-2 m below ground surface.

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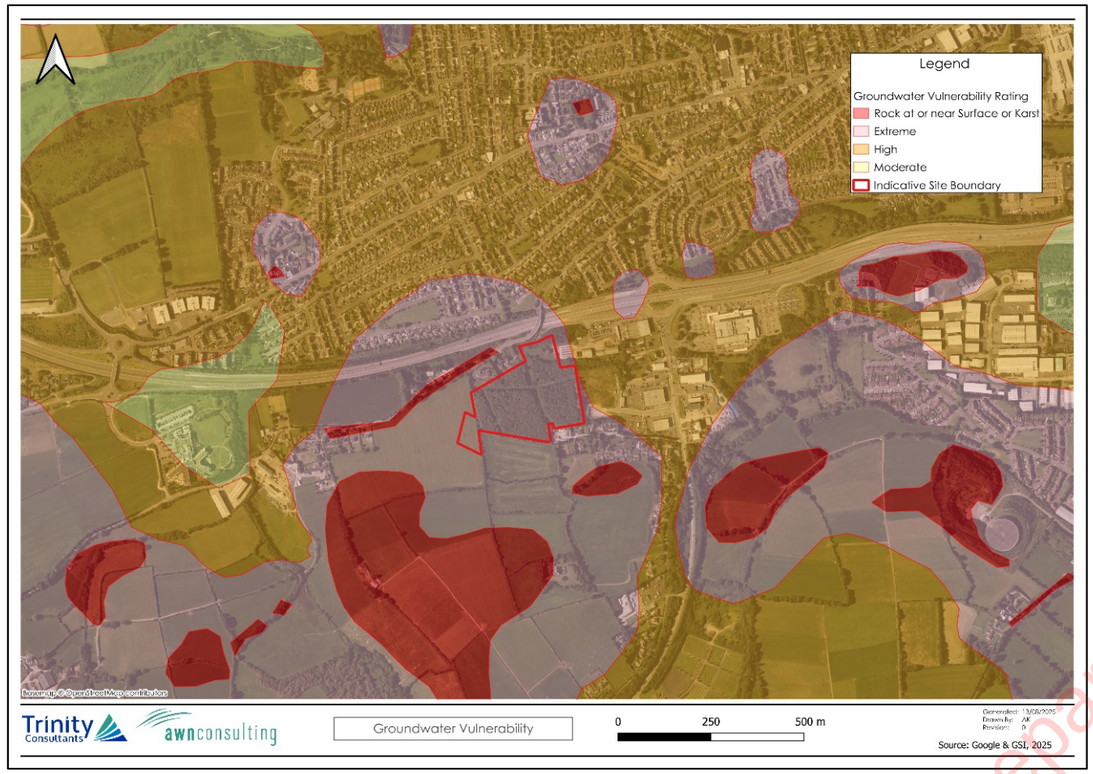


Figure 10.8 Groundwater Vulnerability Rating

10.9.1 Groundwater Wells

The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. The current well index shows there is 1 no. well located within the boundary of the Proposed Development site. There are 8 no. wells mapped in the wider study area within a 1km radius of the Proposed Development site.

As stated in Section 10.7.5 above, there are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas in the vicinity of the Proposed Development site.

The nearest Group Scheme Preliminary Source Protection area is Faran, located c. 14 km northwest of the proposed site. The nearest Public Supply Source Protection area is Minane Bridge PWS (0500PUB2209) located c. 15km east. Neither of these areas share a hydrological or hydrogeological connection to the site.

Figure 10.9 below presents the GSI well search for the area surrounding the site.

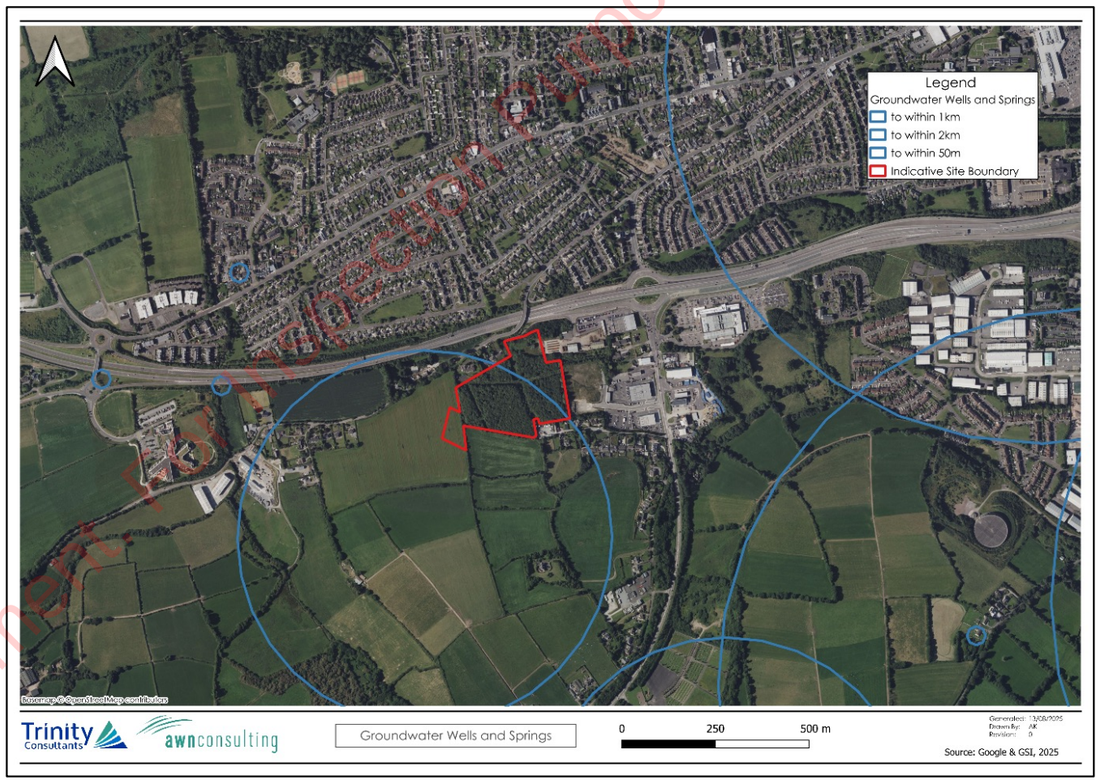


Figure 10.9 Groundwater Wells and Springs

A search of the GSI groundwater well database was conducted to identify registered wells in the vicinity of the proposed development. It should be noted that not all wells are registered in Ireland.

There are no. 5 registered wells within 1km radius of the Development site (Table 1), also presented in Figure 8. The closest well is located c. 130m south of the proposed development site and the following uses are reported.

Table 10.3 Summary of Nearby Wells

GIS Reference	Accuracy (m)	Reported Use	Depth (m)	Reported Yield (m3/day)	Yield Class
1405NEW054	1,000	Unknown	36.6	27.3	Poor
1405NEW134	50	Other	5.5	Unknown	Unknown
1405NEW133	50	Other	12.5	Unknown	Unknown
1405NEW066	2,000	Unknown	24.4	21.8	Poor
1405NEW053	2,000	Unknown	30.5	27.3	Poor
1405NEW062	1,000	Unknown	28.0	38.20	Poor
1405NEW220	50	Agricultural & Domestic	60.0	16.40	Poor
1405NEW221	50	Agricultural & Domestic	73.1	16.40	Poor

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10.9.2 Groundwater Quality

The Water Framework Directive (WFD) 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater, transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. The EPA co-ordinates the activities of the River Basin Districts, local authorities and state agencies in implementing the Directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

Presently, the groundwater body in the region of the site (Ballinhassig East GWB - European Code: IE_SW_G_004) for which the site is located entirely within, has a WFD status of "Good" (WFD Period: 2016-2021) and a WFD risk score (3rd Cycle) of "Not at Risk" of not achieving good status, meaning it has achieved its objectives (Figure 10-10).

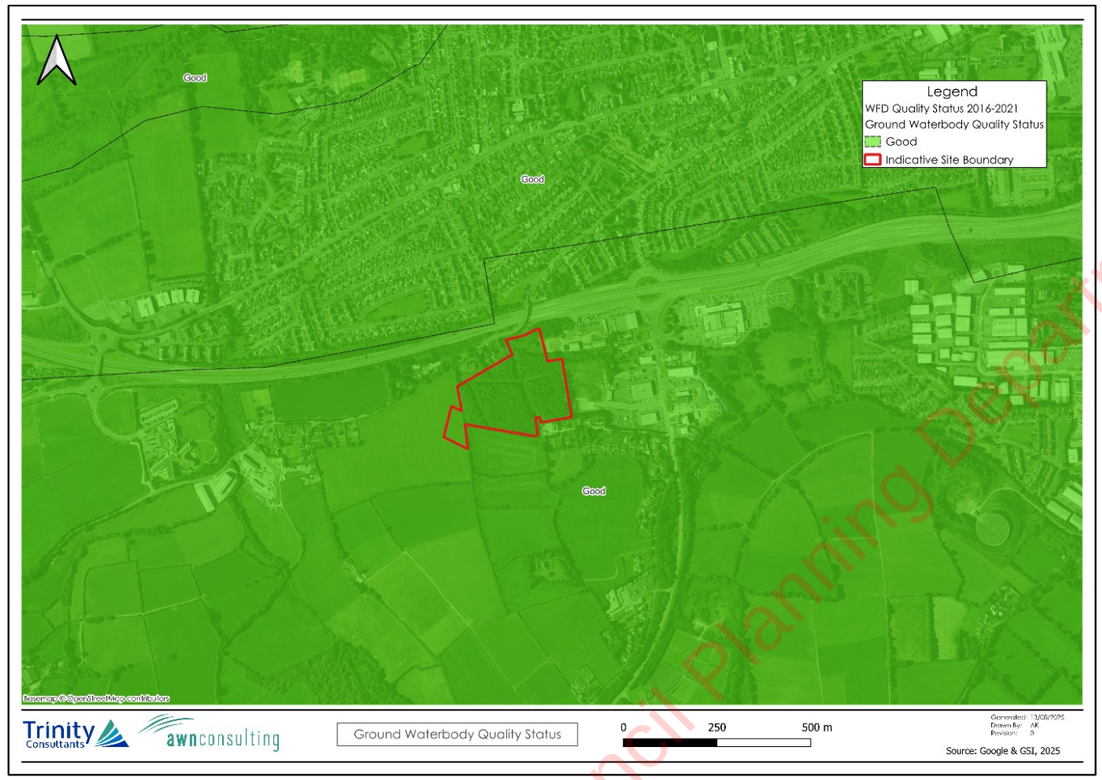


Figure 10.10 Ground Waterbody Quality Status

10.9.3 Groundwater Dependent Terrestrial Eco-Systems (GWDTEs)

Groundwater-dependent terrestrial ecosystems (GWDTEs) are defined as habitats/species that are dependent on groundwater to maintain the environmental supporting conditions required to sustain that habitat and/or species (EPA, 2008). Groundwater may provide either a direct input, such as in turloughs, fens and petrifying springs or, alternatively, the groundwater may have an indirect influence in maintaining high and stable water levels within the habitat, such as with raised bogs. Groundwater bodies are subject to a range of pressures which can result in significant damage to GWDTEs depending on the susceptibility of the pathway and the sensitivity of the receptor.

The are no identified GWDTE's in the vicinity of the proposed development.

10.9.4 Rating of Site Importance of the Hydrogeological Features

Based on the TII methodology (2009) (See Appendix 10.1) the importance of the hydrogeological features at this site is rated as 'Medium' importance based on the assessment that the attribute has a low-quality significance or value on a local scale, based on the fact that the bedrock aquifer underlying the site as a Locally Important Aquifer, the groundwater vulnerability is classified as Extreme. However, there are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas in the vicinity of the Proposed Development site.

10.10 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 'Project Description' of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development.

The Proposed Development as set out in the public notices consists of an overall site area of the development will be c. 5.76 ha.

10.10.1 Construction Phase

The activities required for the construction phase of the Proposed Development represent the greatest risks of potential impact on the hydrological and hydrogeological environment. These activities primarily pertain to the site preparation, excavation and infilling activities required to facilitate construction of the Proposed Development.

10.10.1.1 Site Levelling and Excavations

Removal of topsoil and subsoil cover across localised areas of the Proposed Development site will be undertaken during excavation. The Proposed Development requires soil and stones to be excavated to facilitate construction of foundations and the installation of underground services; the project engineers OSL Butler Consulting Engineers have estimated that c.15,665 m^3 of material will need to be excavated to do so. It is currently envisaged that any excavated site material suitable for reuse will be redistributed throughout to maximise use and minimise import and export requirements. However, any excavated material that does not get reused will be removed from the site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

As outlined above, it is estimated that approximately 15,665 m^3 of material will be excavated and subsequently removed and transported off-site. This activity may temporarily increase the vulnerability of the underlying aquifer, as referenced in Section

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10.9, the Geological Survey Ireland (GSI) has classified the vulnerability of the area encompassing the proposed development site as 'Extreme' (E). This classification reflects pre-development conditions, prior to the installation of paving, stormwater drainage infrastructure, and associated services.

Local minor dewatering may be required during excavation works and groundworks (depending on the time of year development works are carried out). However, there may be potential for change in groundwater levels as a result of local changes in the groundwater regime at the site due to the limited extent of dewatering activities and the natural recharge capacity of the underlying "Locally Important Aquifer (LI)", which may allow for the maintenance of groundwater levels. This ensures that the aquifer's integrity and functionality remain unaffected by any temporary dewatering measures.

10.10.1.2 Storage of soils/aggregates

The employment of good construction management practices and full adherence to a Construction Environmental Management Plan (CEMP) will minimise the risk of pollution of soil, storm water run-off, or groundwater. Such practices include the proper storage of spoil / loose materials on site, such as excavated materials to be used for landscaping purposes; Aggregate materials such as sands and gravels will be stored in clearly marked receptacles in a secure compound area within the contractors' compound on site.

Temporary storage of spoil will be managed to prevent accidental release of dust emissions and uncontrolled surface water run-off which may contain sediment and solid matter. Any excavated material temporarily stockpiled onsite for re-use during reinstatement will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc.

10.10.1.3 Storage of hazardous materials

Temporary storage of fuel will be required on site for construction traffic. Liquid materials i.e., fuel storage will be located within the site compound in temporary designated bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage.

Construction activities will necessitate storage of cement and concrete materials, temporary oils, and fuels on site. Small localised accidental releases of contaminating substances including hydrocarbons have the potential to occur from construction traffic and vehicles operating on site.

10.10.1.4 Import/Export of Materials

There will be a requirement for deliveries and refuelling of imported engineering fill (sands and gravels), and other construction materials including; steel structure, concrete, cladding, ducting and piping. Construction materials will be brought to site by road. Refuelling will be completed in accordance with the best standard practice refuelling procedure. To support the construction of proposed roads, car parks, and buildings, additional fill material may need to be imported.

A 'Just in Time' delivery system will operate to minimise storage of materials. Construction materials will be transported in clean vehicles. Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape material along the public roadway. Where possible it is proposed to source general construction materials from the local area to minimise transportation distances.

Soil requiring removal offsite will be removed from site regularly to ensure there is minimal need for stockpiling. Some of the topsoil removed will be re-used on site for backfill. Any surplus topsoil, subsoil and bedrock material will be transported off site and disposed of at a fully authorised soil recovery site or licenced landfill based on the waste soil classification.

10.10.1.5 Collection and disposal of collected water (rainfall run-off and perched groundwater)

During excavation works, localised perched groundwater within the cohesive deposits/ weathered bedrock, or pooling surface water during and after heavy rainfall events is expected. Dewatering (removing of perched groundwater) is necessary to create a dry working environment and prevent water from seeping into the excavation and flooding the construction site. If dewatering is necessary, it will occur via suitably installed dewatering wells/sumps containing pumps to abstract groundwater and surface water (rainfall landing on the site).

During construction water will discharge to the existing drainage ditch that flows in a west to east direction, along the northern boundary of the site and outfalls to the existing 1800mm storm sewer culvert to the east of the site. Where required, a wastewater discharge licence will be applied for to manage surface water on site during the construction phase. This shall permit the discharge of trade effluent arising from groundwater/surface water ingress on the construction site. In case of any exceedances of discharge permit conditions, water will be disposed of to a licenced facility. The treatment and monitoring of this water prior to disposal will occur outside the construction site in a regional facility north of the site.

10.10.2 Operational Phase

The Proposed Development characteristics which relate to the hydrological and hydrogeological environment during operation are summarised below.

10.10.2.1 Surface Water Infrastructure

To ensure appropriate water quality treatment, a range of Sustainable Drainage System (SuDS) measures will be implemented across the site. These will include Attenuation Tanks, Basins, Permeable Paving, Soakaways, Swales and Rainwater Harvesting. Filtration units will be installed on both the inlet and outlet pipework associated with the underground attenuation tanks to serve as a final stage of treatment, reducing levels of total suspended solids, hydrocarbons, and heavy metals in the surface water runoff.

The treated surface water will ultimately discharge to the existing drainage ditch located to the northeast of the site, in compliance with sustainable drainage and water quality standards. For further technical details regarding the design, specification, and operation of the SuDS measures, reference should be made to the Project Engineers' report prepared by OSL Butler Consulting Engineers.

10.10.2.2 Wastewater Infrastructure

Wastewater from the development is proposed to travel via gravity flow systems into existing foul pipes located to the north of the subject site. Here, the foul effluent will be discharged into a new wastewater pumping station constructed during the neighbouring Waterfall Heights development works. This new foul water network will be a combination of 150mm and 225mm diameter pipes located within Waterfall Road. A confirmation of feasibility (Ref. No. CDS25005971) has been received by Uisce Éireann which confirms the feasibility and arrangements for connection to the existing infrastructure to the foul sewage network currently proposed for the proposed development.

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If approved, the wastewater would be conveyed to the Cork City Wastewater Treatment Plant (WWTP) (D0033) for full treatment. According to its 2023 Annual Environmental Report (AER), the facility currently has the capacity to accommodate the anticipated increase in influent arising from the proposed development. Following treatment, the final effluent from Cork City WWTP is discharged into Lough Mahon, a transitional waterbody located downstream in the estuarine system.

10.10.2.3 Water Supply

It is understood that the water supply to the proposed development will be provided via existing infrastructure installed as part of the adjacent Waterfall Heights development. A confirmation of feasibility (Ref. No. CDS25005971) has been received by Uisce Éireann which confirms the feasibility and arrangements for connection to the public water network.

10.11 Potential Impacts of the Proposed Development

An analysis of the potential impacts of the Proposed Development on the hydrological and hydrogeological environment during the construction and operation is outlined below. Due to the inter-relationship between land, soils and geology with hydrogeology and surface water (hydrology) the following impacts discussed will be considered applicable to both Chapter 9 and 10 of the EIA Report. Mitigation measures included in the design of this project to address these potential impacts are presented in Section 10.12 of this EIAR.

There is no likely potential impact on any protected habitat based on the design criteria and distance of any hydrological or hydrogeological pathways.

10.11.1 Construction Phase

10.11.1.1 Potential Impacts on Surface Water and Groundwater Quality

There is potential for run-off water to become contaminated with pollutants released during construction activity. If not mitigated, contaminated water can pose a temporary risk to the Glasheen Stream, Twopot River, Curraghcen River which discharges to the River Lee, and the underlying 'Locally Important Aquifer' i.e. the Ballinhassig East groundwater body (GWB) (European Code: IE_SW_G_004). During construction of the development, the potential of contamination is associated with the following sources:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
- Excavations/ top and sub soil stripping- Increase sediment run off (erosion during rainfall periods), Pollutant mobilisation (heavy metal runoff), Loss of vegetation;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms. Construction phase sewerage will be contained in a tank and taken by tanker off site for disposal at a licensed waste management facility.

In the absence of mitigation, rainfall run-off during the construction phase may contain increased silt levels or otherwise become polluted from construction activities. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which may in turn impact on local infiltration capacity, downstream infrastructure or watercourses. Concreting operations pose a potential risk of discharging concrete materials into exposed surfaces and percolate to the underlying groundwater. Concrete, especially the cement component, has a high alkalinity level. There is also the potential risk of unintentional discharge of stored materials like fuels, oils, and paints, which could have negative impacts on surface water bodies on-site and downstream, and the underlying groundwater.

There are no potential impacts from wastewater on the hydrological and hydrogeological environment as this will be discharged of appropriately.

In the absence of mitigation measures, the potential impacts during the construction phase on surface water quality and groundwater quality are **negative**, **slight** and **short term**.

10.11.1.2 Potential Impacts on Surface Water and Groundwater Flow and Quality

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads.

The gradual introduction of impermeable surfaces and the compaction of soils across the construction site as a result of the land clearing and earthworks will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off along with sediment loading, which could potentially impact local drainage if not adequately mitigated. This increase in the rate and volume of direct surface run-off can result in increased sediment loading, scouring impacts on local drainage and watercourses, and downstream impacts.

There are no surface water or groundwater abstractions proposed, therefore no potential impacts on the existing surface water and groundwater regime.

There are no proposed permanent diversions of any waterbodies as part of the Proposed Development.

In the absence of mitigation measures the potential impacts during the construction phase on surface water and groundwater quantity and flow are **negative**, **slight** and **short term**.

10.11.1.3 Potential Impacts on Water Framework Directive Status

There is a potential of accidental discharges during the construction phase (as set out in Section 10.11.1). However, these are temporary short-lived events that will not impact on the status of the Glasheen Stream, Twopot River, Curragheen River or the underlying Ballinhassig East groundwater body (GWB) in the long-term. As such the Proposed Development will not cause any significant deterioration or change in water quality status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the third cycle river basin management plan (2022-2027) i.e. Water Action Plan 2025 - A River Basin Management Plan for Ireland.

In the absence of mitigation measures the potential impacts during the construction phase on the Water Framework Directive (WFD) status due to changes to the hydrological environment are negative, slight and short term.

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10.11.2 Operational Phase

10.11.2.1 Potential Impacts on Surface Water and Groundwater Quality

As stated in Section 10.11.1 above, there is an indirect hydrological connection, to the Glasheen Stream, Twopot River, Curragheen River during the construction and operational phase. Surface water runoff from roads, car parking, and hardstanding areas, can potentially contain minor levels of contaminants such as hydrocarbons from trafficked areas.

The surface water runoff during the operational phase will more likely impact stormwater drainage, rather than directly impact the water bodies i.e Glasheen Stream, Twopot River, Curragheen Rive and Ballinhassig East GWB underlying the site, due to the hardstand and drainage infrastructure proposed.

The surface water drainage strategy includes the Proposed Development to be served by a SuDS that is to be integrated with the developments landscaping features and is typically to comprise a combination of multiple measures. Any surface water flows from the Proposed Development will be directed to underground attenuation system to the north of the Proposed Development which discharge to the new wastewater pumping station.

The foul water drainage strategy for the proposed development includes the development of a gravity flow system connecting into the existing foul pipes to the north of the proposed site development which will discharge to the existing foul water pumping station. The proposed new foul sewer network will be located within the public road and green area. From the pumping station, the wastewater will be conveyed through the foul sewer network to the Cork City Wastewater Treatment Plant (WWTP) (D0033), where it will undergo full treatment before being discharged into Lough Mahon, a transitional waterbody. The Cork City WWTP currently has sufficient operational capacity to accommodate the projected additional load from the proposed development.

In the absence of mitigation measures (or design measures) the potential impacts during the operational phase on surface water and groundwater quality are **negative**, **significant** and **long term**.

10.11.2.2 Potential Impacts on Surface Water and Groundwater Flow and Quality

The proposed incorporation of hardstand area and the use of SuDS design measures will have a minor effect on local recharge to ground and has the potential to result in increased run-off from the site if not adequately mitigated.

However, the impact on the overall groundwater regime will be maybe significant considering the site area is underlying “Locally Important’’ Aquifer (LI), which may impact groundwater levels.

An increase in surface water runoff can have an adverse effect on the hydrological regime of downstream environments via flooding and inundation to downstream properties.

As described in Section 10.7.6 above, there are no recorded past flood events within the proposed site development. The closest area prone to reoccurring flood events have been identified along the northwest of the site when the Curraheen River overtops its banks. Therefore, the is a low flood risk associated with the Proposed Development site.

The design of the Proposed Development and drainage infrastructure proposed will ensure that the run-off rate is restricted to greenfield run-off. The development includes the implementation of SuDS and an underground attenuation system. The design includes for a 100-year plus climate change allowance and discharge surface water to the downstream network at an appropriately determined rate. There are no surface water or groundwater abstractions proposed, therefore no potential impacts on the quantity of surface water or groundwater.

The proposed measures ensures that the Proposed Development will not be impacted by predicted flood events.

In the absence of mitigation measures (or design measures) the potential impacts during the operational phase on surface water and groundwater flow and quantity are **negative**, **slight**, and **short-term**.

10.11.2.3 Waste Water Discharge

As stated in Section 10.11.2 above, all foul water generated on the Proposed Development will be directed to a gravity flow system connecting into the existing foul pipes to the north of the proposed site development which will discharge to the existing foul water pumping station. From there, the wastewater will be conveyed through the foul sewer network to the Cork City Wastewater Treatment Plant (WWTP) (D0033) for full treatment. Following treatment, the final effluent will be discharged into Lough Mahon, a transitional waterbody within the estuarine system. The Cork City WWTP currently has adequate operational capacity to accommodate the additional flows generated by the proposed development.

Therefore, no potential impacts are anticipated on Glasheen Stream, Twopot River, Curragheen River, or the Ballinhassig East GWB. The potential impacts on Natura 2000 sites located downstream of the Proposed Development site are further explained in Chapter 7 (Biodiversity).

On the basis of the design and characteristics of the Proposed Development, in the absence of mitigation measures (or design measures) the potential impacts during the operational phase on the foul water network, Glasheen Stream, Twopot River, Curragheen River, or the Ballinhassig East GWB from the proposed foul water drainage are **negative**, **significant** and **short-term** in respect of wastewater loading.

10.12 Mitigation Measures

10.12.1 Construction Phase Mitigation

10.12.1.1 Outline Construction & Environmental Management Plan

The OCEMP outlines and explains the construction techniques and methodologies which will be implemented during construction of the proposed development.

Construction works and the proposed mitigation measures are informed by best practice guidance on the prevention of pollution during development projects including but not limited to:

- Construction Industry Research and Information Association (CIRIA), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016);
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (4th edition), (C741);
- Enterprise Ireland Best Practice Guide, Oil Storage Guidelines (BPGCS005).
- Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board);

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- Central Fisheries Board Channels and Challenges – The enhancement of Salmonid Rivers;
- CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors;
- CIRIA C648 Control of Water Pollution from Constructional Sites;
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA 2008); and
- Inland Fisheries Ireland (IFI) – A Guideline on Planning for Watercourses in the Urban Environment.

The OCEMP sets out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The OCEMP will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the site will be trained in the implementation of the procedures. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

All mitigation measures outlined here, and within the CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

10.12.1.2 Suspended solids

As there is potential for run-off to indirectly discharge to a watercourse (Glasheen Stream, Twopot River, Curragheen River and eventually to the River Lee), in order to manage the potential impact associated with sediment and sediment runoff the following mitigation measures will be implemented during the construction phase.

- During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the excavation site which limits the potential for any offsite impacts.
- Silt reduction measures on site will include a combination of silt traps and hydrobrakes measures.
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.

10.12.1.3 Cement/concrete works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil and aquifer.

Wash-outs will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. Relevant personnel working on the site will be suitably trained in the implementation of the procedures.

10.12.1.4 Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to surface water (and groundwater) systems:

- Designation of bunded refuelling areas on the site;
- Provision of spill kit facilities across the site;
- Where mobile fuel bowsers are used, the following measures will be taken:
  - » Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
  - » The pump or valve will be fitted with a lock and will be secured when not in use;
  - » All bowsers to carry a spill kit and relevant operatives must have spill response training;
  - » Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/ container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they will be secured and on spill pallets; and
- Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

In addition to the measures above, all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in designated bunded refuelling areas, which will be away from surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

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10.12.1.5 Wastewater Management

Foul wastewater arising from the site will be managed and controlled for the duration of the construction works.

Foul water from the offices and welfare facilities on the site will be collected in portable sanitary facilities and disposed of appropriately by licenced contractor.

The construction contractor will implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the site will be suitably trained in the implementation of the procedures.

10.12.1.6 Surface Water and Groundwater Flow and Quantity

Surface water discharge from the site will be managed and controlled for the duration of the construction works until the surface water drainage system of the Proposed Development is complete.

The construction contractor will be required to manage suspended solids during the construction phase and will be permitted to discharge treated construction water to the established stormwater network.

The construction activities will require surface water management to prevent pollution and degradation of habitats from a chemical spill or run off containing excessive suspended solids that complies with guidelines and best practices such as "Control of Water Pollution from Construction Sites and Guidance for Consultants and Contractors" (CIRIA 532, 2001)

10.12.2 Operational Phase Mitigation

10.12.2.1 Surface Water and Groundwater and Quantity

The design has taken account of the potential impacts of the development on surface water quality; measures have been incorporated in the design to mitigate these potential impacts.

The proposed surface water management design establishes an indirect hydrological connection to the Glasheen Stream, Twopot River, Curragheen River, located near the site, during the operational phase.

To mitigate potential contamination from surface water runoff, which may originate from roads and hardstanding areas, a sustainable drainage system (SuDS) will be implemented. This system is designed to minimize the risk of contaminants, such as hydrocarbons, entering the stormwater drainage network and subsequently impacting surface water bodies like the Glasheen Stream, Twopot River, Curragheen Rive, as well as groundwater bodies, including the Ballinhassig East GWB underlying the site.

The surface water drainage strategy integrates various measures, including attenuation ponds, rainwater harvesting, permeable paving and downstream defenders. These features will effectively manage surface water flows, directing them to an underground attenuation pond and infiltration tanks to maximize their storage potential. Flow control devices will be installed downstream of the pond outlet pipes to ensure that surface water runoff is stored efficiently before entering the receiving environment.

Refer to the Engineering Report, prepared by OSL Butler Consulting Engineers submitted separately as part of the planning application for further information on the proposed storm water management and design.

10.12.2.2 Surface Water and Groundwater Flow and Quantity

The proposed incorporation of hardstand areas and SuDS design measures may slightly reduce local groundwater recharge and increase runoff if not properly managed, potentially causing flooding and affecting downstream environments. However, the overall impact on the groundwater regime is expected to be insignificant due to the site's small area relative to the total aquifer, and construction will avoid areas with localized flooding to mitigate flood risks.

To mitigate these risks, the design of the development and its drainage infrastructure will ensure that runoff rates are restricted to those of greenfield conditions. The development will incorporate SuDS and an underground attenuation system, with a design that up to and including the 100-year plus climate change allowance and discharge surface water to the downstream network at an appropriately determined rate. The proposed surface water management strategy aims to prevent surcharging during a 1 in 2-year storm events up to and including the 1 in 100 years plus allowance for climate change.

Furthermore, there are no proposed surface water or groundwater abstractions, eliminating potential impacts on the quantity of surface water or groundwater resources.

10.13 Monitoring Measures

10.13.1 Construction Phase

During construction phase the following monitoring measures will be considered. Monitoring will be undertaken in accordance with planning conditions and undertaken by the contractor in compliance with the project CEMP.

Contractors will carry out regular inspections to confirm compliance with the CEMP. Daily inspections by contractors will address potential environmental impacts including dust, litter, waste management and general housekeeping.

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items.

Regular inspection of surface water run-off and sediments controls (e.g., silt traps). Inspection and maintenance of the silt control measures during construction phase is crucial to ensuring that they work as intended. They will remain in place throughout the entire.

10.13.2 Operation Phase

No future surface water monitoring is proposed for the Proposed Development due to the low hazard potential at the site.

Hydrocarbon interceptors will be maintained and cleaned out in accordance with the manufacturer's instructions.

Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to surface water.

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10.14 Interactions and Cumulative Effects

10.14.1 Interactions

This EIAR addresses potential interactions and inter-relationships between the environmental factors discussed. This covers both the construction and operational phases of the proposed development.

The EIAR must also consider in-combination effects, or the interactions between the different factors discussed.

Dust emissions have the potential to settle on plants causing impacts to local ecology. Mitigation measures during the construction phase of the proposed development will ensure that dust generation is minimised and the effect on biodiversity will be short term, imperceptible and neutral. There is potential for impacts to biodiversity associated with uncontrolled discharges to surface waters during operational phase. With the implementation of mitigation measures outlined in this chapter and Chapter 11 of the EIAR, and in the CEMP, interactions between biodiversity and hydrology/hydrogeology will be **short-term**, **imperceptible**, **neutral**.

Surface water runoff can also have an effect on soil quality in the area, with chemicals or suspended solids having an effect on soil fertility and contamination. With the proposed mitigation measures outlined in this chapter and in Chapter 9 of the EIAR (Land and Soils), the potential interaction between these is reduced to a **short-term**, **imperceptible**, **neutral effect**.

10.14.2 Cumulative Effects

Existing developments that are already built and in operation contribute to the characterisation of the baseline environment. As such any further environmental impacts that the Proposed Development may have in addition to these already constructed and operational developments has been assessed in the preceding sections of this chapter.

Any future application on these lands will be subject to planning approval and environmental assessment as required. Any new development proposed on the lands after the submission of the Proposed Development would be accompanied by an EIAR, or EIA Screening as required and take into consideration the development of this site.

10.14.2.1 Construction Phase

In relation to the potential cumulative impact on hydrology during the construction phase, the construction works which would have potential cumulative impacts are as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses.
- Stockpiled material will be stored on hardstand away from surface water drains, and gullies will be protected during works to ensure there is no discharge of silt-laden water into the surrounding surface water drainage or to ground.
- Contamination of surface water from accidental spillage and leakage from construction traffic and construction materials is possible unless project-specific measures are put in place for each development and complied with.

The works contractors for other planned or permitted developments will be obliged to ensure that measures are in place to protect surface water and groundwater quality in compliance with legislative standards for receiving groundwater quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016) and surface water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019).

The implementation of mitigation and monitoring measures previously detailed above as well as the compliance of other developments with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the hydrological and hydrogeological environment during the construction phase of the proposed development.

The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible and short-term**.

10.14.2.2 Operational Phase

The proposed development and other permitted developments will result in an increase in hard standing which will result in localised reduced recharge to ground.

All developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislative standards for receiving groundwater quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016) and surface water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019).

The implementation of mitigation and monitoring measures previously detailed above as well as the compliance of other developments with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the hydrological and hydrogeological environment during the operational phase of the proposed development.

The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible and long-term**.

10.15 Residual Impact Assessment

10.15.1 Construction Phase

10.15.1.1 Surface Water and Groundwater and Quantity

The implementation of the mitigation and monitoring measures detailed in Section 10.12 and 10.13, will ensure that the potential impacts on surface water and groundwater quality during the construction phase are adequately mitigated. There will be no change to overall flow and quality within the hydrological and hydrogeological regime as a result of construction.

The residual effect on surface water and groundwater quality during the construction phase is considered to be **neutral**, **imperceptible** and **short-term**.

10.15.1.2 Surface Water and Groundwater Flow and Quantity

The implementation of the mitigation and monitoring measures detailed in Section 10.12 and 10.13, will ensure that the potential impacts on surface water and groundwater flow and quantity during the construction phase are adequately mitigated. There will be no change to overall flow and quality within the hydrological and hydrogeological regime as a result of construction.

The residual effect on surface water and groundwater flow and quantity during the construction phase is considered to be **neutral**, **imperceptible** and **short-term**.

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10.15.2 Operational Phase

10.15.2.1 Surface Water and Groundwater and Quantity

The implementation of the mitigation and monitoring measures detailed in Section 10.12 and 10.13, will ensure that the potential impacts on surface water and groundwater quality once the Proposed Development is constructed and operational are adequately mitigated.

The residual effect on surface water quality during the operational phase is considered to be **neutral**, **imperceptible** and **long-term**.

10.15.2.2 Surface Water and Groundwater Flow and Quantity

The implementation of the mitigation and monitoring measures detailed in Section 10.12 and 10.13, will ensure that the potential impacts on surface water and groundwater flow and quantity once the Proposed Development is constructed and operational are adequately mitigated.

The residual effect on surface water and groundwater flow and quantity during the operational phase is considered to be **neutral**, **imperceptible** and **long-term**.

10.16 References and Sources

- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area;
- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1: 100,000 mapping;
- River Basin Management Plan for Ireland 2018-2021.
- Water Action Plan 2025 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001); and
- National Parks and Wildlife Services (NPWS) – Protected Site Register.
- Hydrometric data (www.floodinfo.ie/map/floodmaps/), OPW CFRAM Flood Risk Mapping, www.epa.ie/hydronet.
- Ballinhassig East GWB: Summary of Initial Characterisation (GSI, 2004)
- OSL Butler Consulting Engineers - Engineering Service Report (2025)
- OSL Butler Consulting Engineers – Drainage Impact Assessment (2025)

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CHAPTER ELEVEN

BIODIVERSITY

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McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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CHAPTER ELEVEN

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CHAPTER 11 | Biodiversity

11.1 Introduction

11.1.1 Overview and Aims

DNV was commissioned by McCutcheon Halley, acting on behalf of Bridgewater Homes Ltd., to undertake an Ecological Impact Assessment (EcIA), presented as a Biodiversity Chapter, in relation to a Proposed Development at Ardarostig, Bishopstown, Cork, hereafter referred to as 'Proposed Development' or 'Site' when referring to the site area of the Proposed Development.

This Biodiversity Chapter assesses the potential effects of the Proposed Development on habitats and species; particularly those protected by national and international legislation or considered to be of nature conservation importance on or adjacent to the Site. This report will describe the ecology of the Site, with emphasis on habitats, flora and fauna, and will assesses the potential effects of the Construction and Operational Phases of the Proposed Development on these ecological receptors. The report follows Guidelines for Ecological Impact Assessment in the UK and Ireland, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and supplemented by the National Roads Authority (2009) guidelines for Assessment of Ecological Impacts of National Road Schemes. The purpose of this Report is to:

- Set out the methodologies used to inform the assessment.
- Identify Key Ecological Receptors (KERs) within the Zone of Influence (ZOI).
- Assess the impacts from the Proposed Development on the KERs and the resulting significant effects.
- Set out measures to avoid or mitigate negative impacts.
- Assess the residual effects after the incorporation of agreed avoidance or mitigation measures to ensure legal compliance.
- Set out agreed measures to offset significant residual effects.
- Set out opportunities for ecological enhancement.

11.1.2 Quality Assurance and Competence

DNV Biodiversity is a multi-disciplinary consultancy specialising in the areas of the Environment, and Planning. All DNV consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

DNV Biodiversity remains fully briefed in European and Irish environmental policy and legislation. DNV staff members are highly qualified in their field. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. Tom Ryan, Senior Ecologist and Ornithologist with DNV, undertook the Breeding Bird Surveys, habitat, fauna and flora surveys and desktop research for this report. Bryan Thompson, Senior Ecologist with DNV and Brian McCloskey, Ornithologist and Ecologist with DNV, undertook Bat Activity Surveys for this report.

This chapter of the EIAR has been prepared by Tom Ryan Senior Ecologist at DNV, reviewed by Alice Clarke, Senior Ecologist at DNV and approved by Matthew Pedan, Principal Ecologist at DNV.

Tom Ryan holds a B.Sc. in Environmental and Natural Resource Management (Hons.) and a Post-Graduate Diploma in Environmental Management with GIS. Tom is an experienced Ecologist who has specialised in ornithology and terrestrial mammals with over 9 years' experience in ecological consultancy along with a lifetime of personal interest and experience in wildlife management. Tom has extensive experience in ecological surveying, desktop research, preparing Appropriate Assessment (AA) Screening Reports, Ecological Impact Assessment Reports (EcIAs), Bird Activity Reports and detailed Species-Specific Mapping. His ability to deal with and understand a range of species, survey methods and habitats is excellent, having an in-depth knowledge and understanding of EU and Irish legislation.

Bryan Thompson has a B.Sc. in Environmental Biology (Hons) and a PhD in Marine Ecology from University College Dublin, and a wealth of experience in desktop research, literature scoping-review, and report writing, as well as practical field experience (Habitat surveys, intertidal surveys, winter bird surveys, bat surveys, mammal surveys and vantage point surveys) Bryan has experience in compiling Biodiversity Chapters of EIARs, EcIAs, AA Screening and Natura Impact Statement (NIS) reports, and in the overall assessment of potential impacts to ecological receptors from a range of developments.

Brian McCloskey is an Ecologist and experienced Ornithologist with 12 years of bird survey experience. Brian is a longstanding and active member of Bird Watch Ireland and has provided Ornithology survey work for ecological consultancies, e.g., vantage points surveys of gulls, terns, raptors, waders, and wildfowl; hinterland surveys of the above as well as riverine species; and breeding waders and country birds. Brian is highly experienced with all survey methodologies and with surveying all species groups of Irish birds and migrants.

11.1.3 Relevant Legislation and Policy Context

An EcIA is a process of identifying, quantifying, and evaluating potential effects of development-related or other actions on habitats, species and ecosystems (CIEEM, 2018). When an EcIA is undertaken as part of an EIA process (in the form of an EIAR Biodiversity Chapter) it is subject to the EIA Regulations (under the Planning and Development Regulations 2001-2023). An EcIA is not a statutory requirement, however it is a best practice evaluation process. The EcIA detailed within this Biodiversity Chapter is provided to assist the Competent Authority with its decision making in respect of the Proposed Development.

There is a number of pieces of legislation, regulations and policies specific to ecology which underpin this assessment. These may be applicable at a European, National or Local level. Legislation at the International level relevant to the Proposed Development are listed below:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter the 'Habitats Directive'.
- Directive 2009/147/EEC, hereafter the 'Birds Directive'.
- Directive 2011/92/EU, hereafter the 'EIA Directive'.
- EU Regulation 1143/2014, on Invasive Alien Species.
- Convention on the Conservation of European Wildlife and Natural Habitats 1982, hereafter the 'Bern Convention'
- The Convention on the Conservation of Migratory Species of Wild Animals 1983, hereafter the 'Bonn Convention'.
- Ramsar Convention on Wetlands 1971, hereafter referred to as 'Ramsar'.
- Water Framework Directive 2000/60/EC, hereafter the 'WFD'.

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National legislation and policy relevant to the Proposed Development are listed below:

- Wildlife Act 1976, as amended in 2000.
- Flora (Protection) Order 2022.
- The Planning and Development Act 2000 (as amended)
- The Planning and Development Act 2024.
- National Biodiversity Plan 2023-2030.
- All-Ireland Pollinator Plan 2021-2025.

Additionally, Natural Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with Special Areas of Conservation (SAC) and/or Special Protection Area (SPA) sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

Local plans and policies relevant to the Proposed Development are listed below:

- Cork City Heritage and Biodiversity Plan (2021-2026)
- Cork City Development Plan (2022-2028).

Further details on legislation and policy relevant to the Proposed Development are detailed in Appendix 11.1.

11.2 Description of the Proposed Development

11.2.1 Proposed Development Description

The proposed development will consist of:

- The construction of 246 no. residential units, comprising a mix of 1,2,3 and 4 bed semi-detached, townhouses, duplexes and apartments;
- A creche;
- The provision of landscaping and amenity areas and all associated infrastructure and services to include a vehicular and pedestrian/cycle access point, roads, parking, lighting and drainage.

The full description of the Proposed Development is outlined in Chapter 2 of this EIAR.

11.2.2 Site Location

The subject Site is located within the extended Cork City development boundary within the Southwestern Suburbs. The subject Site is situated approximately 6.1 kilometres (km) southwest of Cork City Centre (15 minutes' drive), 2.5km southwest of Wilton Shopping Centre (8 minutes' drive) and 1.1km west of Bishopstown Court Neighbourhood Centre. The Site lies to the south of the Bandon Road roundabout and the South Ring Road N40. The land uses on the Bandon Road (N71) comprise light industrial uses including car sales show rooms, service stations, and a public storage warehouse. The total Site area comprises 5.76 hectares (ha) and has a flat topography. There is a net developable area of 4.8ha. The Site is bounded by the N40 and 4 no. dwellings to the north, light industrial uses to the east, agricultural land to the south and a residential development to the west, which is currently under construction. Access to the Proposed Development is to the west along Waterfall Road.

The location of the Site is presented in Figure 11-1 below.

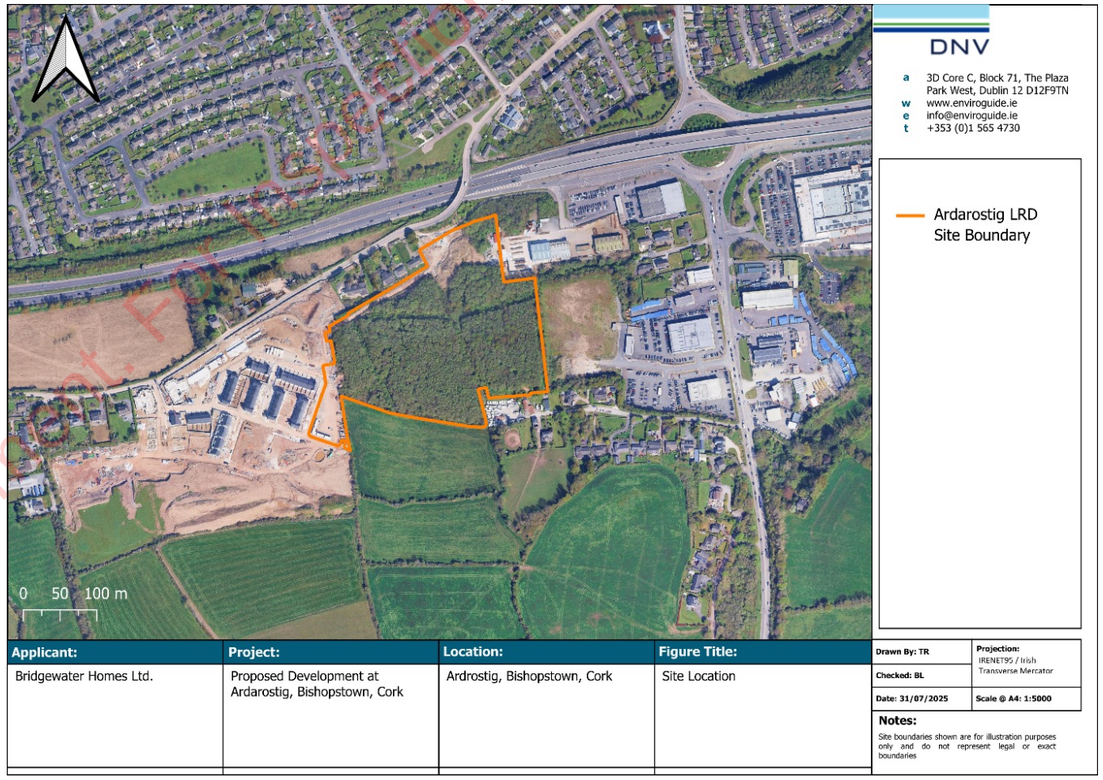


Figure 11.1 Site location

11.2.3 Description of the Construction Phase

It is estimated that the project will commence in January 2026 with the Construction Phase lasting c. 24 months as outlined in the Outline Construction Environmental Management Plan (CEMP) prepared by OSL Butler (Doc: 24066-OSL-00-RP-C-0001 P02) (2025).

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11.2.3.1 Construction Phase Order of Activities

It is proposed that the Construction Phase will have a number of phases of activities with dwelling units being developed on a sequential basis (OSL Butler, 2025a).

The Construction Phase will include the following order of activities:

11.2.3.1.1 Phase 0a (duration up to 3 weeks)

- Site clearance including vegetation.
- Site office setup.
- Welfare facilities, signage, compound, temporary foul and storm sewers.

11.2.3.1.2 Phase 0b (duration 12-18 months)

- Storm and foul water service construction.
- Provision of footpaths, lighting, roadways and reinstatement of public roadways.

11.2.3.1.3 Phase 1 (duration 11 months)

- Construction of 102 residential units and creche.
- Involving the placement of c. 180 construction staff.

11.2.3.1.4 Phase 2 (duration 6 months)

- Construction of 66 residential units in tandem with demand/ sale.
- Involving the placement of c. 180 construction staff.

11.2.3.1.5 Phase 3 (duration 7 months)

Construction of 78 residential units in tandem with demand/ sale.

11.2.3.2 Compound Facilities and Parking

- Clean permeable construction enclosed with security fencing.
- Designated staff and machinery parking.
- Way finding signage.
- Removal of waste material off Site to an approved handling facility.

11.2.3.3 Traffic Management

- Construction Traffic Management Plan (CTMP).
- Material Storage Zone.
- Dedicated Construction haulage routes.
- Road cleaning programme where required.

11.2.3.4 Resource and Waste Management Plan

- Waste arising from the Site will be considered in relation to the waste management hierarchy of prevention, reduce, reuse, recycle, energy recovery and disposal.
- All waste will be sent to appropriately authorised facilities.

11.2.3.5 Sediment and Water Pollution Control Plan

Measures are set out in the OCEMP to minimise the risk of contamination of watercourses/ groundwater, sediment and erosion, over ground spill and flows of petrochemicals, unlicenced discharges. Measures outlined are listed below;

- Concrete batching and segregated washdown off-Site
- 50m buffer from sensitive areas including drainage ditches
- Water abstraction from existing watercourses will not be permitted
- Implementation of sediment control
- Minimisation of potential for erosion
- Prevention of sediment contaminated water leaving the Site
- Water quality monitoring
- Overground oil and diesel storage
- Off-Site wastewater disposal
- Road cleaning
- Dewatering

11.2.3.6 Dust and Dirt Generation Control Measures

The OCEMP states the following in relation to dust control measures (OSL Butler, 2025a):

"The following measures will be implemented:

- Apply a speed limit of at least 20km/hr for on-site vehicles
- Provide water bowsers during periods of dry weather to ensure unpaved areas are kept moist.
- Spray exposed site haul roads during dry and / or windy weather.
- Ensure paved roads are kept clean and free of mud and other materials. Sweep hard surface roads, inside and outside the site, to ensure roads are kept clear of debris, soil or other material.
- Restrict un-surfaced roads to essential site traffic.
- Provide water bowsers during periods of high winds and dry weather conditions to ensure moisture content is high to increase the stability of the soil.
- During the proposed works the following mitigation measures shall be implemented to minimise dust emissions:
  - » Protect overburden material from exposure to wind by storing the material in sheltered regions of the site.
  - » Regular watering of stockpiles during dry and windy periods.
  - » Located any stockpiles away from sensitive receptors, (i.e. receptors sensitive to dust release).
  - » Provide tarpaulins over all unacceptable excavated materials being carted off site.

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» Control vehicle speeds and impose speed restrictions, (speed can mobilise dust).

» During dry spells and if deemed necessary monitoring of dust levels shall be carried out using the Bergerhoff Method i.e. analysis of dust collecting jars left on-site (German Standard VDI 2119, 1972). Results will be compared to the TA Luft guidelines (TA Luft, 1972). Should an exceedance of the TA Luft limit occur during, additional mitigation measures, for example more regular spraying of water shall be implemented.

» The excavating machines will be cleaned on a daily basis to ensure no excess grease and dust is left on the machine. This will be carried out at low level below the height of the hoarding to prevent any mud coming in contact with the public.

The Contractor will be required to produce an Air Quality and Dust Management Plan including Best Practice Measures to control dust and in particular, measures to prevent dust nuisance. The principal objective of the Air Quality and Dust Management Plan will be to ensure that dust emissions do not cause significant nuisance at receptors near the Proposed Project. A dust deposition monitoring programme will be implemented during the Construction Phase in order to verify the continued compliance with relevant standards and limits."

11.2.3.7 Noise and Vibration

The Construction Phase will involve the generation of noise through construction plant machinery and delivery of material to Site. The noise generated during the development phase will be minimised in accordance with standard guidelines and regulations as described in the preliminary OCEMP (OSL Butler, 2025a):

"*During the construction of the works, the Contractor shall comply with:*

- BS 5228: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 and Part 2.
- Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRS, Revision 1, 2004)
- Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration
- The following acceptable levels are described in the Transport Infrastructure Ireland (TII) publication

Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, March 2014. These limits are applied during the construction of road infrastructure projects at the facades of NSRs." Noise levels in accordance with TII (2014) are to be adhered to during the Construction Phase and it is unlikely that there will be a requirement for nighttime or evening work (OSL Butler, 2025a).

Noise and Vibration levels are to be minimised through a range of 'reductive/mitigation measures, as detailed in full within the OCEMP (OSL Butler, 2025a).

11.2.4 Description of the Operational Phase

The Operational Phase will comprise residential use that is consistent with the neighbouring land use in the area and that of the neighbouring Strategic Housing Development.

11.2.4.1 Drainage and Water Supply

11.2.4.1.1 Proposed Water Services

The Engineering Report accompanying this application under separate cover (OSL Butler 2025b) details the existing services and proposed water connection plan as below: "*Water supply to the proposed site will be served from the infrastructure which is being installed as part of the Waterfall Heights development".*

11.2.4.1.2 Foul Water Management

The Engineering Report accompanying this application under separate cover (OSL Butler 2025b) details the existing services and proposed water connection plan as below:

The Proposed Development will be connected to the foul sewer network that is already laid north of the Site and running eastwards to meet the existing public network, subsequently ending up at Carrigrennan Wastewater Treatment Plant (WWTP), which operates under a wastewater discharge licence (D0033-01).

The wastewater infrastructure serving the development is a conventional piped system, designed and constructed in accordance with the Uisce Éireann Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03). A Wastewater pumping station has recently been installed and will facilitate the wastewater needs of both the proposed Development and the neighbouring Heitor Site. The system will be completely segregated from the surface water drainage network as per the below extract from the accompanying drainage design scheme accompanying this report under separate cover.

The wastewater discharged from the site will ultimately discharge to the Carrigrennan WWTP. The industrial wastewater discharge from the development is zero. If insufficient capacity is available in the public infrastructure, there is a potential for increased levels of pollution in receiving waters.

For further details of the wastewater drainage system, refer to the Engineering Report and accompanying drawings prepared by OSL Butler and submitted under separate cover as part of the planning application.

11.2.4.1.2.1 Potential Upgrade Works to pipe network

Upgrade works are planned for the pipe network which lies downstream of the recently installed WWPS and will facilitate the transfer of wastewater from the Proposed Development toward Carrigrennan WWTP. According to consulting engineers, these upgrade works are understood to be approx. 147m in length. Whilst the works are outside the planning/ legal boundary, they can be facilitated, with this upgrade to be assisted by the developer. There is storage capacity in the existing WWPS holding of approximately 309,000 litres, which would allow for the rising main to be terminated for a period to facilitate work downstream of the WWPS.

According to consulting engineers, the applicant will also be cooperative with regards to access the existing WWPS and any associated records associated with the system and any associated additional works will be carried out in accordance with the connection agreement and in line with Standard details and Code of Practice.

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11.2.4.1.2.2 Statement of Design Acceptance

After submitting the pre-connection enquiry CDS24008665 to Uisce Eireann outlining how a connection to the Uisce Eireann Network can be facilitated through the foul sewerage infrastructure network developed under CDS2100847802, the applicants are now in receipt of an updated Confirmation of Feasibility and Statement of Design Acceptance CDS25005971 in relation to water and wastewater connections to the public network from the Proposed Development.

The Water network will have to be upgraded from 150mm to 200mm for approximately 200m. This work will be carried out by Uisce Éireann and the costs for this will be included in the connection fee. Any associated additional works will be carried out in accordance with the connection agreement and in line with Standard details and Code of Practice.

There is also a requirement for wastewater network upgrades, downstream of the proposed development. These upgrade works are understood to be approximately 160m in length, involving the upgrade to a 200mm diameter sewer network, with this upgrade to be funded by the developer. Any associated additional works will be carried out in accordance with the connection agreement and in line with Standard details and Code of Practice.

11.2.4.1.3 Surface Water Management

The Engineering Report accompanying this application under separate cover (OSL Butler 2025b) details the existing services and proposed water connection plan as below:

"The existing lands currently drains by means of a series of sod and stone ditches linking with the surrounding informal ditch regime. There is an existing 300mm diameter surface water pipe to the north of the site, crossing Ardarostig, and eventually discharges into an existing stream running along Forest Road…. It is proposed to service the proposed development by means of a connection to the existing 300mm diameter surface water pipe to the north".

Sustainable Drainage System (SuDS) are to be incorporated to the design of the Proposed Development where possible. Surface water management for the proposed development is designed to comply with the 'Greater Dublin Strategic Drainage Study (GDSDS) Regional Drainage Policies Technical Document - Volume 2, New Developments, 2005' and the 'Greater Dublin Regional Code of Practice for Drainage Works, V6.0 2005'. CIRIA Design Manuals C753, C697 and C609 have also been consulted to design the surface water drainage system within the site. (OSL Butler, 2025b).

SuDS features are designed to incorporate the following elements:

- Green Roofs
- Swales
- Bioretention / Tree Pits
- Permeable Paving
- Attenuation Systems

The proposed SuDS features will reduce the runoff volume to greenfield runoff rates via evaporation, transpiration, infiltration and depression storage. A maintenance regime will be in place for the proposed SuDS devices mentioned above in order to facilitate the long-term upkeep of all proposed water treatment and attenuation systems.

11.2.4.1.4 Landscape Plan

The proposed landscape plan as prepared by SRLA (2025) is displayed in Figure 11-2 below. Several biodiversity measures are proposed, many of which have been influenced by the All-Ireland Pollinator Plan 2021-2025. Hedging will consist of native species. The plan also includes the planting of native trees including Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Birch (*Betula pendula*), Scots Pine (*Pinus sylvestris)* and Oak (*Quercus robur*) as well as pollinator friendly shrubs on the periphery of the Site and within planting areas within the proposed communal areas.

The landscape plan also aims minimise hedgerow disturbance and removal, allowing for the retention and development of a central hedgerow spine, which is central to the landscape design for the Site.



Figure 11.2 Landscape Plan (SRLA, 2025)

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11.2.4.1.5 Lighting Plan

Lighting has been developed by Molloy Consulting (2025) to be bat and nocturnal wildlife friendly and follow the guidelines set out by the Bat Conservation Trust (BCT) (Collins, 2023) and the Institute of Lighting Professionals (ILP) (2023) Figure 11-3.



Figure 11.3 Ardarostig Illuminance Report (Molloy, 2025)

11.3 Methodology

11.3.1 Scope of Assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys and evaluate the nature conservation importance of the Site;
- Identify and assess the direct, indirect and cumulative ecological implications or impacts of the Proposed Development during its lifetime; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of the development.

11.3.2 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the Site's natural environment. The desk study, completed in April 2025 relied on the following sources:

- Information on species records and distributions, obtained from the National Biodiversity Data Centre (NBDC) at maps.biodiversityireland.ie;
- Information on Floral Protection Order (FPO) Bryophytes database at dahg.maps.arcgis.com.
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at gis.epa.ie;
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at www.gsi.ie;
- Information on the network designated conservation sites, site boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at www.npws.ie;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland;
- Information on the existence of permitted development, or developments awaiting decision, in the vicinity of the Proposed Development from the National Planning Application Database available at: https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de; and
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team.

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in Section 11.15 - References.

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11.4 Zone of Influence

The ZOI for a project is the area over which ecological features may be affected by changes as a result of the Proposed Development and associated activities. This is likely to extend beyond the Proposed Development Site, for example where there are ecological or hydrological links beyond the site boundaries (CIEEM, 2024). The ZOI will vary with different ecological features, depending on their sensitivities to an environmental change.

Furthermore, ZOI in relation to European sites is described as follows in the 'OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management' (OPR, 2021):

"*The zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework and not by arbitrary distances (such as 15 km).*"

11.5 Identification of Relevant Designated Sites

To determine the ZOI of the Proposed Development for designated sites, reference was made to the OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management' (OPR, 2021), a practice note produced by the Office of the Planning Regulator, Dublin. This note was published to provide guidance on screening for AA during the planning process, and although it focuses on the approach a planning authority should take in screening for AA, the methodology is also readily applied in the preparation of reports such as this to identify all relevant designated sites potentially linked to the Proposed Development.

As noted above, the most recent guidance advises against the use of arbitrary distances that serve as precautionary ZOI (e.g., 15km), and instead recommends the application of the Source-Pathway-Receptor (S-P-R) model in the identification of designated sites, stating that "This should avoid lengthy descriptions of European sites, regardless of whether they are relevant to the Proposed Development, and a lack of focus on the relevant European sites and issues of importance". Although this statement refers to European sites, it is also applicable to other designated sites.

Thus, the methodology used to identify relevant designated sites comprised the following:

- Identification of potential sources of effects based on the Proposed Development description and details;
- Identification of potential pathways between the Site of the Proposed Development and any designated sites within the ZOI of any of the identified sources of effects.
  - » Water catchment data from the EPA (www.epa.ie) were used to establish or discount potential hydrological connectivity between the Proposed Development and any designated sites.
  - » Groundwater and bedrock information used to establish or discount potential hydrogeological connectivity between the Proposed Development and any designated sites.
  - » Air and land connectivity assessed based on Proposed Development details and proximity to designated sites.
  - » Consideration of potential indirect pathways, e.g., impacts to flight paths, *ex-situ* habitats, etc.
- Review of Ireland's designated sites to identify those sites which could potentially be affected by the Proposed Development in view of the identified pathways, using the following sources:
  - » European sites and nationally designated sites (e.g., NHAs and pNHAs) from the NPWS (www.npws.ie);
  - » Ramsar sites from the Irish Ramsar Wetland Committee (https://irishwetlands.ie/irish-sites/);
  - » Other internationally designated sites e.g., UNESCO Biospheres; and
- Regional development plans to identify any remaining sites or areas designated for nature conservation at a local level.

11.6 Field Surveys

11.6.1.1 Preliminary Ecological Appraisal

Preliminary ecological surveys were carried out on-Site on 11th April 2025. The field survey for the Preliminary Ecological Assessment (PEA) included habitat mapping, an invasive species survey, and a general search for signs of protected species that may be expected to be present based on the desk study, as well as an initial assessment of habitat suitability for same. The preliminary walkover allowed for the determination of any need for further targeted species or habitat surveys.

11.6.1.2 Habitat and Flora Surveys

Habitat and flora surveys of the Site were conducted on 11th April 2025 by DNV. Where possible species compositions and abundance are described using the DAFOR (Dominant, Abundant, Frequent, Occasional or Rare) scale, a simple method of assigning abundance categories to species. Habitats were categorised to level 3, according to the Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000). The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011) published by the Heritage Council, and the National Roads Association (NRA) (now known as Transport Infrastructure Ireland (TII)) guidance on 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (TII, 2009). Habitats within the surrounding area of the Proposed Development were classified based on views from the Site and satellite imagery where necessary (Google Earth, Digital Globe and OSI). The habitat and flora surveys cover the period considered suitable for such surveys as per the abovementioned guidance (April-October). The surveys also included a search for any rare or protected plant species which may be present at the Site.

11.6.1.3 Invasive Species Surveys

Invasive species surveys were incorporated into the above habitats and flora survey carried out at the Site on 11th April 2025. During this ecological walkover, the location of invasive species, where they were encountered, was documented through the use of remote mapping software (QField), along with the extent of the area they cover. The invasive plant species survey primarily focused on plant species that are listed on Schedule III of the European Communities (Birds and Habitats) Regulations and considered to be 'High impact' invasive species e.g., Japanese Knotweed (*Reynoutria japonica*). Incidental observations of other terrestrial plant species known to be potentially invasive, such as Butterfly Bush (*Buddleja davidii*), were also recorded, where found.

11.6.1.4 Non-volant Mammals Surveys

Mammal surveys of the Site were carried out in conjunction with the initial habitat surveys on 11th April 2025. The Site was searched for tracks and signs of non-volant mammals as per Bang and Dahlstrom (2001) (i.e., mammals which are incapable of flight). The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area. The possibility for the Site and surrounding areas to hold Badger (*Meles meles*) was also considered during the initial Site survey as per best practice guidelines (Harries, Cresswell & Jefferies 1989; NRA 2005). No further surveys for Badger were recommended following the initial Site visit.

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11.6.1.5 Bats

11.6.1.5.1 Preliminary Bat Roost Assessment

A daytime inspection of the Site was undertaken on 11th April 2025, in adherence to best practice guidelines (Collins, 2023). The aim of the inspection was to search for indication of the presence of roosting bats. Buildings and trees on Site were visually assessed from the ground with the aid of a torch and binoculars. The roost inspection comprised a detailed inspection of structures and trees on Site. These were subject to exterior and interior inspections (where possible) to search for evidence of bat use. This includes live and dead specimens, droppings, feeding remains, oil staining and noise (Collins 2023). Trees were searched for Potential Roosting Features (PRFs) such as hollow trunks, knot holes, peeling bark, splits, cracks, and crevices (Collins 2023; Andrews 2018). Collins (2023) recommends that structures and trees are assessed for their ability to support roosting bats under separate categorisations using professional judgement and sub-categories as presented in Table 4.1 (Collins, 2023) and summarised below.

Structures are categorised as:

- Negligible – No suitable features observed, however, a small element of uncertainty remain;
- Low – A structure with one or more roost features as used by individual bats opportunistically at any time of year;
- Moderate – A structure with one or more roost features that could be used by bats on a regular basis or by a larger number of bats; and
- High – A structure with one or more roost features that are obviously suitable for use by a larger number of bats on a regular basis, and potentially for longer periods of time. These features have the potential to support high conservation status roosts.

Trees are categorized separately accordingly to Table 4.2 of Collins (2023). These classifications are:

- NONE – Either no PRFs in the tree or highly unlikely to be any;
- FAR – Further assessment required to establish if PRFs are present in the tree; and
- PRF – A tree with at least one PRF present.

Where a tree contains at least one PRF, each PRF is further assessed according to Table 6.2 (Collins 2023). PRFs are scored as either:

- PRF-I – PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
- PRF-M – PRF is suitable for multiple bats and may therefore be used by a maternity colony.

For trees with PRF-Is only, no further surveys are required, but appropriate compensation for all PRF-I's must be designed and incorporated in advance of impacts along with a Precautionary Working Method Statement (PWMS). As the Site increases in suitability for roosting bats e.g., PRF-Ms present, the survey effort increases accordingly. A PRF-M will require a detailed inspection, such as aerial inspection, conducted over three survey visits, a minimum of three weeks apart, which should be carried out between May and September with at least two in the period May to August. Where features are inaccessible by ladder, climbing, or Mobile Elevated Working Platforms (MEWP), or too extensive for a PRF inspection, the aerial inspection should be replaced with emergence surveys carried out between May and September with Night Vision Aids (NVA) where possible or otherwise surveyed using Advanced Licence Bat Survey Techniques (ALBST), such as trapping, tagging, and radio-tracking to inform of the importance of a roost. No emergence surveys were conducted due to the lack of suitable roost features.

11.6.1.5.2 Preliminary Bat Habitat Suitability Assessment

The Site was also assessed in relation to potential bat foraging habitat and potential bat commuting routes in conjunction with the walkover survey on 11th April 2025. This assessment evaluated the habitats present on Site and in the wider area for bat foraging and commuting suitability. Habitat suitability is assessed qualitatively from Negligible to High:

- Negligible – No suitable foraging or commuting habitats on Site
- Low – Suitable but isolated habitats that could be used by small numbers of commuting and/or foraging bats, such as poorly connected gappy hedgerows, lone trees, unvegetated streams, etc.
- Moderate – Suitable continuous habitat connected to the wider landscape that could be used by commuting and/or foraging bats, such as treelines, scrub, grassland, water, etc.
- High – Continuous high-quality habitat that is well-connected to the wider landscape, and is likely used regularly by commuting and/or foraging bats, such as river valleys, broadleaved woodland, woodland edge, grazed parkland, etc.

11.6.1.5.3 Bat Landscape Suitability

The Bat Conservation Ireland Landscape Suitability Model (Lundy et al., 2011) provides a habitat suitability index for bat species across Ireland. The model divides the country into 1 km grid squares and ranks the habitat within the squares according to its suitability for various bat species. The scores are divided into five qualitative categories of suitability, namely:

- 0.0000000 - 13.000000: Low
- 13.000001 - 21.333300: Low – Medium
- 21.333301 - 28.111099: Medium
- 28.111100 - 36.444401: Medium – High
- 36.444402 - 58.555599: High

11.6.1.5.4 Bat Activity Surveys (Nighttime Bat Walkover (NBW))

Bat Activity Surveys were carried out on three occasions in total. One visit in Spring and two during the Summer period.

The methodology was chosen to ensure all bat commuting and/or foraging activity on/around the Site was adequately quantified. The layout of the Site, proposed works, and current baseline conditions meant that a targeted survey effort (NBW) was most suitable. This methodology was adapted from the most recent bat survey guidelines as described by the Bat Conservation Trust *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, (Collins et al, 2023).

Two set points were surveyed for a 45-minute period after sunset, followed by a transect survey of the entire Site and its perimeter, targeting the most suitable habitat for commuting and foraging bat species. The NBW vantage points were strategically located adjacent to the most suitable foraging and commuting habitat on Site.

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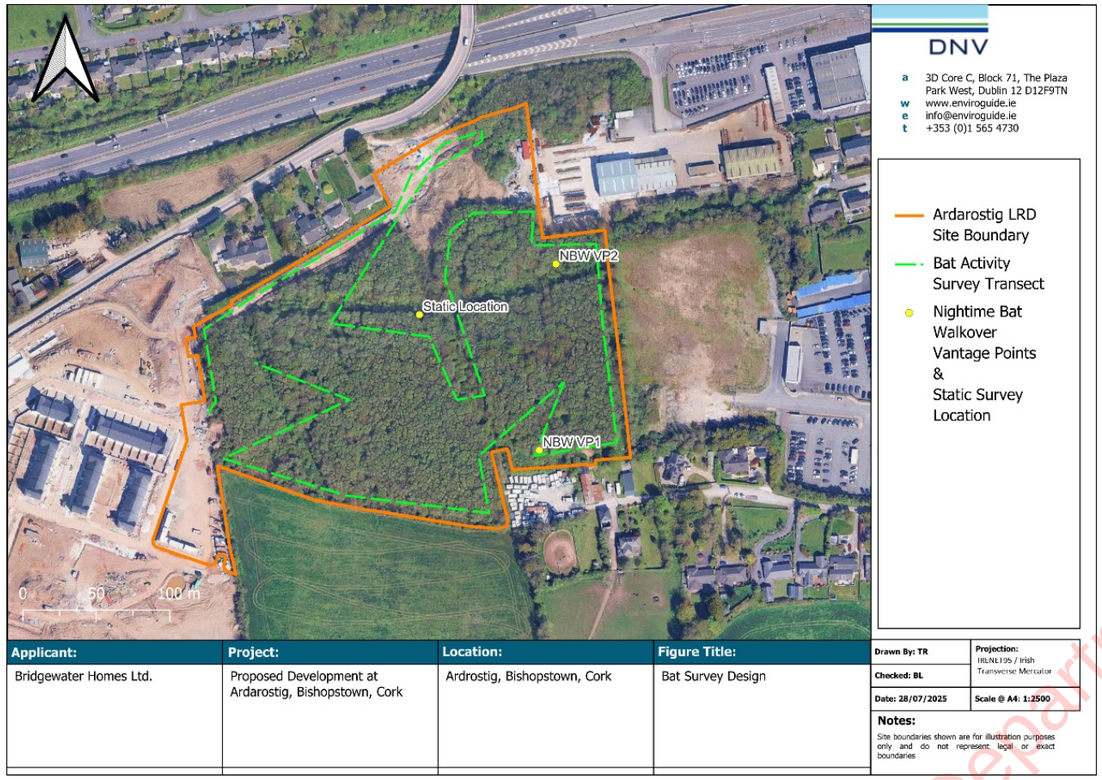


Figure 11.4 Bat activity survey design

Table 11.1. Survey Effort with weather conditions during NBW Bat Activity Surveys at the Proposed Development

Date	Sunset	Survey Start & End	Weather at start
22nd May 2025	21:46	21:46 23:25	Temperature: 18 C Wind: Beaufort 1 Rain: None
02nd July 2025	21:58	22:00 23:35	Temperature: 16 C Wind: Beaufort 2 Rain: None
15th July 2025	21.46	21:46 23:25	Temperature: 15 C Wind: Beaufort 3 Rain: None

11.6.1.5.5 Bat Activity Surveys (Static Detector Deployment)

Four static deployments were carried out in total. The static detector was placed to ensure optimum detection rates, over a five-night period per deployment, consistent with the guidance issued by Collins (2023). To get a complete picture of bat usage of the Site, three static deployments were carried out during Spring/Summer period of 2025. A fourth static deployment is scheduled for Autumn 2025 and data will be available on request.

11.6.1.5.6 Bat Data Analysis

Species were identified from recordings using BatExplorer (version 2.2.6.0). Bat data was analysed, and species assigned to each record with reference to species identification guides such as Russ (2012).

Each record i.e., a sequence of bat calls/pulses, is noted as a bat pass and indicates the level of bat activity for each species recorded. It is important to note that bat passes are representative of activity levels and do not necessarily denote individual bats. For example, some bats such as *Pipistrelle* species may continuously circle a treeline or hedgerow and multiple calls may represent one individual circling an area. Alternatively, Leisler's bats (*Nyctalus leisleri)* recorded early in a survey are likely to be commuting high overhead, and each call may represent a singular bat. Therefore, a bat pass is a measure of activity and is not representative not of the number of bats present.

In general, activity levels are classified from low to high. Low activity comprises less than 10 bat passes per hour, medium is equal to or greater than 10 bat passes per hour, and anything above 50 bat passes per hour is considered high.

11.6.1.6 Birds

11.6.1.6.1 Bird Scoping Survey

During the preliminary Site surveys on 11th April 2025, a list of all bird species encountered was recorded. The survey methodology employed was based on that recommended in standard literature used by for example the British Trust for Ornithology (BTO) (Gillings et al, 2007; Bibby et al, 1992 and Gilbert et al, 1998), which has subsequently been adapted into guidelines for ecological consultants by the Bird Survey & Assessment Steering Group (2025). During the survey, the Site was walked slowly, approaching all habitats within and adjacent to the Proposed Development and scanning and listening for birds. The locations of birds seen and heard were recorded using standard BTO codes and activity symbols, to provide an overview of bird species using the Site.

During this bird survey the Site was thoroughly assessed to determine potential roosting and nesting sites for birds. Special attention was given to identifying areas where birds were likely to congregate or build nests, such as trees, hedgerows and scrub, and other habitable structures where they may occur.

During the inspection, any signs of bird activity were documented. This included the presence of birds themselves, their nests, feathers, droppings, and any other indicative evidence.

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11.6.1.6.2 Breeding Bird Surveys

In addition to the initial Site walkover on 11th April 2025, three additional Breeding Bird Surveys were carried out during the core breeding season to inform the evaluation of the on-Site habitats for breeding bird species. The surveys were carried out in accordance with and adapted from standard literature and guidelines set out in for example Gilbert et. al. (1998), Bibby et al (2000), Gillings et al (2007) and Birdwatch Ireland & National Parks and Wildlife Service (2012), which has subsequently been adapted into guidelines for ecological consultants by the Bird Survey & Assessment Steering Group. (2022).

During the survey, the Site was walked slowly, approaching all habitat within and adjacent to the Proposed Development and scanning and listening for birds. The presence of all birds on Site was recorded with all possible, probable, and confirmed breeding activity recorded where relevant.

This survey was carried out and designed in order to account for bird species most likely to be encountered in the area based on the habitats present and results of the desk study. The ZOI in relation to birds was set at 300m based on the Proposed Development description and the avifauna species most likely to be encountered on Site and in the surrounding hinterland. The ZOI was chosen with cognisance to guidelines set out by the Bird Survey & Assessment Steering Group (2022) and all surveys were carried out by experienced and suitably qualified ornithologists (TR and BMC).

The optimal timing of breeding bird surveys on Site means that the assemblages of breeding birds, both within and in the hinterland of the Site have been adequately accounted for and will be fully considered as part of the assessment of the Proposed Development.

Table 11.2 Survey Effort with weather conditions during Breeding Bird Survey at the Proposed Development

Date	Start Time	Duration	Weather Conditions
11/04/25 (PEA)	08:00	03:30	Light Breeze, dry, good visibility, 12°C, 33-66% cloud cover.
29/05/25	06:00	01:45	Fresh Breeze, dry, good visibility, 15°C, 66-100% cloud cover.
24/06/25	09:30	02:00	Light Breeze, dry, good visibility, 18°C, 66-100% cloud cover.
08/07/25	06:30	02:00	Light Breeze, dry, good visibility, 15°C, 66-100% cloud cover.

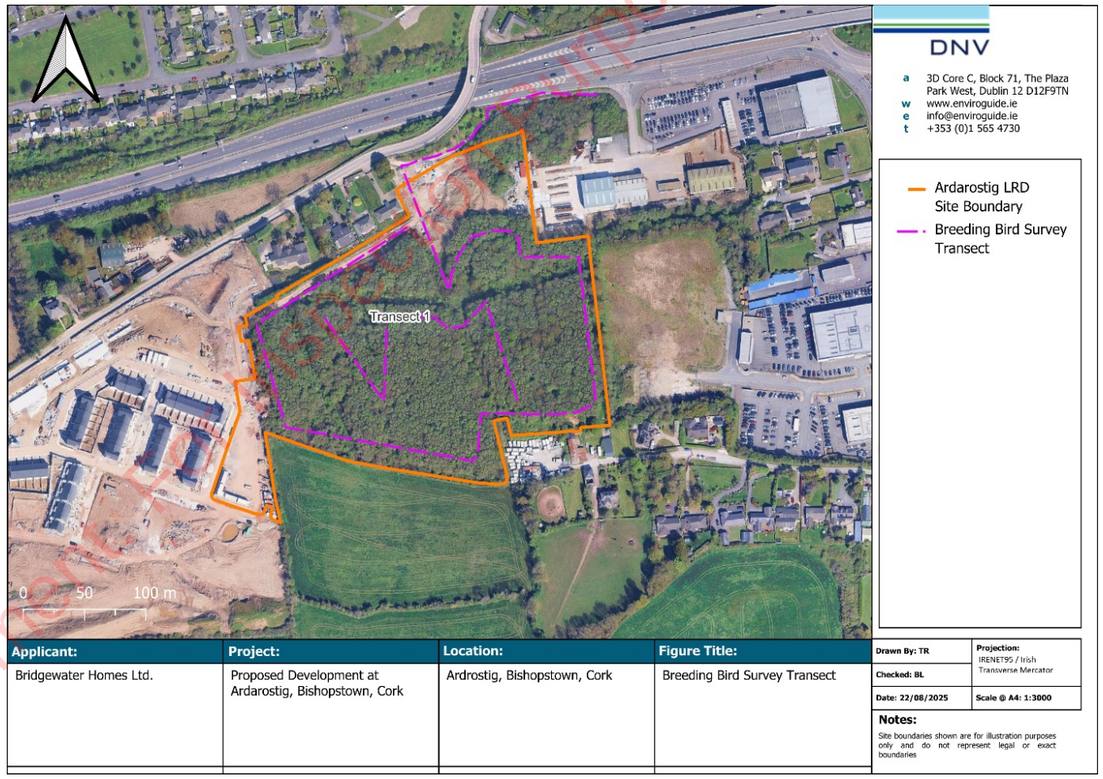


Figure 11.5 Breeding Bird Survey Design

11.6.1.7 General Fauna Surveys

The Site was assessed for the presence of fauna other than mammals and birds in conjunction with the habitat surveys undertaken at the Site on 11th April 2025. The Site was searched for signs of aquatic fauna (incl. amphibians, fish and invertebrates), reptiles and rare/endangered invertebrates, and habitats were assessed for their potential suitability for same.

11.6.1.8 Hedgerow Appraisal Survey

A hedgerow assessment of the Site was conducted by DNV on the 7th of July 2025. Hedgerows were categorised on their ecological value as ascertained from current research from Hedgerow Appraisal System (HAS) (Foulkes et al, 2013) and the Hedgerow Evaluation and Grading System (HEGS) (Clements and Toft, 1993). These systems follow a standardised methodology that grades hedgerows based on their overall structure, connectivity, botanical diversity and the presence of hedgerow features such as banks and ditches. Each hedgerow is then assigned a grade based on the results.

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According to Foulkes et al. (2013), hedgerows are defined as linear strips of woody plants with a shrubby growth form that cover more than 25% of the length of a field or property boundary that have been deliberately established or managed. They often have associated banks, walls, ditches (drains), or trees. Hedges that have developed into lines of trees which no longer display a shrubby growth-form (remnant hedgerows) are also included. A remnant hedgerow is generally indicated by a (broken) line of mature or senescent plants in tree, rather than shrub form. These almost invariably have a high percentage of gaps, although may have bits of shrubby growth (including bramble *(Rubus* spp.*)* along their length.

Foulkes' definition of a hedgerow correlates with Fossitt (2000), which defines hedgerows as:

"*Linear strips of shrubs, often with occasional trees, that typically form field or property boundaries. Dimensions of hedgerows are taken here as being mainly less than 5m high and 4m wide. When wider or taller than this, or dominated by trees, the habitat should be considered as a narrow strip of scrub or woodland, or as a treeline - WL2. Some hedgerows may be overgrown or fragmented if management has been neglected, but they should still be considered in this category unless they have changed beyond recognition. Linear strips of low scrub are included in this category if they occur as field boundaries*."

It should be noted that gaps that are filled with brambles and/or non woody vegetation were still recorded as gaps in this report following Foulkes et. al (2013). All hedgerows and treelines that were surveyed at the Site were assessed as being 'hedgerows' according to the above definitions.

It was necessary to modify the HAS approach as the objective of Foulkes et al. (2013) was originally to devise a national database of hedgerows, whereby samples from 1 km² areas are surveyed, rather than hedgerows associated with a particular site.

The field data collected was also used to assess the condition and significance of each hedgerow based on the following categories (after Foulkes et al. 2013):

Condition:

- Structural variables.
- Continuity.
- Negative indicators/degradation/issues affecting long term viability etc.

The condition of the hedgerow is ranked on a scale of 0 to 3, where 0 is Unfavourable, 1 is Adequate, 2 is Favourable and 3 is Highly Favourable. The four categories are divided into several criteria for each which are assessed with a similar rank 0 to 3 individually.

Significance (Ecology):

- Floral Species Diversity Significance.
- Ground Flora Significance.
- Structure, Construction & Associated Features
- Habitat Connectivity Significance etc.

The significance of the hedgerow is ranked on a scale of 0 to 4, where 0 is Low Significance, 1 is Slight Significance, 2 is Moderate Significance, 3 is Significant and 4 is High Significance. The aforementioned five categories are divided into several criteria, each of which are assessed with a rank of 0 to 4 individually.

In both assessments, the higher the score, the more favourable the condition of the hedgerow. A score of 0 in any category is indicative of a hedgerow that is in an unfavourable condition overall.

Overall score for each category is calculated as the average of the rank values for each criterion. If the average value is a fraction, it is rounded up.

11.7 Consultation

A pre application Section 32B opinion meeting was held on 13th June 2025 in consultation with Cork City Council. The EcIA carried out in this Biodiversity Chapter includes the following as highlighted in the LRD Opinion:

- The preparation of appropriate assessment screening
- Details of any planned retention, protection and management of hedgerows on Site including a dedicated hedgerow appraisal;
- Consideration of the plan to place private gardens adjacent to an existing hedgerow and the long-term management implications; and,
- A description of protected species occurring on Site and appropriate mitigation where required.

11.8 Ecological Assessment

This Report has been undertaken following the methodology set out in Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2024); and with reference to the National Roads Authority 'Guidelines for Assessment of Ecological Impacts of National Road Schemes' (NRA, 2009) and the Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (EPA, 2022) and BS 42020:2013 Biodiversity: Code of practice for planning and development (BSI, 2013).

The evaluation of significant effects should be based on available scientific evidence. Based on the precautionary principle, if the available information is not sufficient, then a significant effect may be assumed likely to occur.

11.8.1 Evaluation of Ecological Features

The value of the ecological features, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation at different geographical scales (NRA, 2009), presented in Appendix 11.2. This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. Based on best practice (CIEEM, 2024), any features considered to be less than of local value are not assessed within this EcIA.

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11.8.2 Impact Assessment

As per NRA guidelines, impact assessment is only undertaken of Key Ecological Receptors (KERs). The assessment of the potential impact of the Proposed Development on the identified KERs was carried out with regard to the criteria outlined in the EPA Guidelines (EPA,2022) These guidelines set out a number of parameters that should be considered when determining which elements of the Proposed Development could constitute impact or sources of impacts. These include;

- Positive, neutral or negative effect;
- Significance;
- Extent;
- Probability;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process, or feature, e.g., the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to an adverse effect on a sensitive habitat.

11.8.3 Assessment of Cumulative Impacts and Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a Proposed Development results in individually insignificant impacts that, when considered in combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Relevant plans and policies (see Section 11.11.5.2) were reviewed to identify any potential for negative cumulative impacts with the Proposed Development. Additionally, existing planning permissions from the past five years (from 2019 onwards) within the ZOI of the Proposed Development were reviewed, with particular focus on potential cumulative impacts on the identified KERs. Long-term developments were also considered where applicable.

11.8.4 Avoidance, Mitigation, Compensation and Enhancement Measures

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement. When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

It is important for the EcIA to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g., through changes in scheme design. In practice, avoidance measures are typically implemented during the design stage via discussions and re-design (e.g., avoiding a sensitive habitat by relocating a building). Avoidance measures are therefore rarely reported within an EcIA, which focuses on assessing the final design.
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ.
- Compensation describes measures taken to offset residual effects, i.e. where mitigation in situ is not possible.
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

11.9 Limitations

Every effort has been made to provide a comprehensive description of the site; however, the following specific limitations apply to this assessment:

- An extensive search of available datasets for records of rare and protected species within proximity of the Proposed Development has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.
- At the time of the hedgerow appraisal survey, the Site had recently been subject to Site clearance. The survey was therefore carried out based on the Site's altered conditions. As a result, some recorded scores may not accurately reflect the original continuity, margins, vegetation, or degradation status of the hedgerows and treelines prior to construction.
- A hedgerow along the northwest boundary of the site faces a private dwelling on one side. Due to lack of access to the property, certain data, such as the presence of a grassy margin and the composition of ground flora, could not be surveyed.

11.10 Ecological Baseline Conditions

This Section sets out the baseline conditions for the ecological features within the Site using the findings of the desk study and field surveys.

11.10.1 Hydrology, Geology and Hydrogeology

The Site is located in the Lee, Cork Harbour and Youghal Bay Catchment (Catchment ID 19) and in the Glasheen [Corkcity]_SC_010 sub-catchment (Sub-catchment ID 19_17).

The Glasheen Stream (Cork City) (EU Code: IE_SW_19G040700).is located 0.37km east of the Site, this flows in a northerly direction and joins the Lee (Cork) Estuary Upper (EU Code: IE_SW_060_0950) after a distance of approximately 4km.

Two Pot Stream (Cork City) Stream (EU Code: IE_SW_19T050890) is the next closest stream, located approximately 0.54km west of the Site. This flows in a northerly direction for 1km before converging with the Curragheen Stream (EU Code: IE_SW_19C120740) which also flows north for approximately 4.5km to where it joins the Glasheen (Cork City) stream which in-turn flows into Lee (Cork) Estuary Upper (EU Code: IE_SW_060_0950).

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Finally, the Moneygurney Stream (a.k.a. Douglas (Lee) Stream) (EU Code: IE_SW_19M300900) is located 1.7km east of the Site. This flows for approximately 5.4km east before entering Lough Mahon Transitional Waterbody (EU Code: IE_SW_060_0750).

The EPA water quality monitoring data for the stations on both Two Pot stream and Glasheen Stream located closest to the Site is summarised in Table 11-3.

Table 11.3 EPA Monitoring Stations and assigned Q Values

EPA Monitoring Station name	Station Code	Location from Site	Distance from Site	Assigned Q value
M04 Bandon Road	RS19G040140	Southeast upstream of Glasheen Stream	0.24km	No data available
M05 Woodhaven Estate	RS19G040190	North downstream of Glasheen Stream	0.63km	No data available
GLASHEEN (Cork City) – Woodhaven Estate	RS19G040200	North downstream of Glasheen Stream	0.77km	No data available
GLASHEEN (Cork City) - Sandbrook Estate	RS19G040300	Northeast downstream of Glasheen Stream	1.56km	No data available
LEE (CORK) - Weir u/s Victoria Br (Intake)	RS19L030800	Northeast where Glasheen meets Lee	4.39	3-4 "Moderate"

The Site of the Proposed Development is situated on the Ballinhassig East Ground waterbody (EU Code: IE_SW_G_004). The bedrock aquifer identified beneath the Site is mapped as "Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones" (LI) (GSI, 2025).

The Groundwater vulnerability rating assigned to groundwater beneath the majority of the Site is mapped as "Extremely vulnerable" and a portion of the eastern side is mapped as "High" (GSI, 2025).

The soil beneath the majority of the Site is mapped as "Clashmore" (1100n) described as coarse loamy drift with siliceous stones (GSI, 2025).

The subsoil beneath the north-western boundary of the Site is mapped as "Bedrock at or close to the Surface" (GSI, 2025).

The Waterbody Status for river, groundwater, transitional and coastal water bodies relevant to the Site as recorded by the EPA (2025) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003), Part IV of the European Communities Environmental Objectives (Surface Waters) Regulations 2009 and Part IV of the European Communities Environmental Objectives (Groundwater) Regulations 2010, are provided in Table 11-4.

Table 11.4 WFD Risk and Water Body Status

Waterbody Name	Water body; EU code	Location from Site	Distance from Site (km)	WFD water body status (2016-2021)	WFD 3rd cycle Risk Status	Hydraulic Connection to the Site
Surface Water Bodies						
Glasheen (Cork City)_010	IE_SW_19G040700	East	0.37km	Poor	At risk	Yes – surface water flow
TWO POT (Cork City)_010	IE_SW_19T050890	West	0.54	Moderate	At risk	Yes – surface water flow
CURRAGHEEN (Cork City)_010	IE_SW_19C120740	North	1.54km	Moderate	At risk	Yes – surface water flow followed by transport via Two Pot stream
Glasheen (Cork City)_010	IE_SW_19M300900	East	1.7km	Good	Under Review	No
Transitional Water Bodies						
Lee (Cork) Estuary Upper	IE_SW_060_0950	Northeast	2.6km	Moderate	At Risk	Downstream of select rivers/ streams
Lough Mahon	IE_SW_060_0750	East	6.3km	Moderate	At Risk	Downstream of Moneygurney Stream
Groundwater Bodies						
Ballinhassig East	IE_SW_G_004	N/A	N/A	Good	Not at risk	Underlying groundwater-body

11.10.1.1 Site Drainage

11.10.1.1.1 Surface Water Layout

The proposed network will outfall to the existing surface water drainage ditch which lies within the development boundary.

Subject to local authority approval the design intent is to connect into the existing 1800mm surface water storm sewer, running west to east and passing the north of the site.

Connection to same can be made without interference to the road network, as the pipes are to the south of the existing path/ roadway infrastructure.

Surface water from the site will be collected and attenuated within the site curtilage, with a peak discharge rate of 2l/s/ha for the 1 in 100 Year rainfall event (including an allowance for climate change). As part of the development, several different SuDS measures will be provided to minimise the impact on water quality and water quantity of the runoff and maximise the amenity and biodiversity opportunities within the site.

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A suitable location will be agreed to provide for the storm water to pass through a grit sump and class 1 hydrocarbon interceptor (CNSB20s/21) before connecting to the Existing Mains Network (OSL Butler, 2025a).

11.10.1.1.2 Sustainable Drainage Systems (SuDS)

The surface water system will be designed to accommodate a 1:100, 1:30 and 1:5-year storm event + 20% climate change without flooding any property.

The remainder of the site will be attenuated through parking spaces with a permeable stone base which has been designed with a storage capacity for a 1:5, 1:30 and 1:100 storm event + 20% climate change. There is an outlet pipe to the main storm sewer after the storm water is attenuated through the permeable stone layers. The landscape plan and surface water design plan have also included small swales and filter drains, and tree pits in the design (OSL Butler, 2025a). Further detail on existing Site drainage conditions can be found in Chapter 7 of this EIAR.

11.10.2 Designated Sites

All European sites potentially linked to the Proposed Amendments have been identified and fully assessed in the AA Screening Report (Stage 1: Screening) accompanying this submission under separate cover. A summary of the AA conclusions is given below.

Other Nationally or Internationally designated sites potentially linked to the Proposed Development are identified in Section 11.9.2.3 below.

11.10.2.1 European Sites Appropriate Assessment (AA)

An AA has been completed (Stage 1: Screening) for the Proposed Development which identified any potential S-P-R links to designated European sites. The Site of the Proposed Development is not located within or adjacent to any designated European sites and neither direct or indirect habitat loss or disturbance is considered an issue in this case (Table 11-5). The Proposed Development will not be dependent on any resource use of any European sites. The AA Screening Report prepared by DNV (2025) identified potential direct pathways to European sites as detailed below. These pathways have been screened out for further assessment and are deemed insignificant due to the nature and location of the Proposed Development. The following is extracted from the AA Screening report (DNV, 2025):

> *"Cork Harbour Estuary SPA (004030), situated within Lee (Cork) Estuary Lower and Lough Mahon, is the closest European Site to the Site of the Proposed Development of those within the Zone of Influence. Surface water run-off from the Site of the Proposed Development has the potential to enter the Glasheen Stream, situated 0.37km east of the Site, where it is be transported downstream for approximately 4km in a northerly direction towards the Lee (Cork) Estuary within which the Cork Harbour SPA is situated after approximately 4km of easterly flow. Whilst this is a potential hydrological pathway, visits to the Site have confirmed that there is a south to north sloping gradient, which would prevent surface water from flowing towards the nearest streams. It is also considered that the significant 4km stretch of transitional water between the mouth of the Glasheen stream and Cork Harbour Estuary SPA (004030) will act as a substantial buffer to prevent any contaminated water from reaching the European Site in any capacity, regardless of whether it be in high enough volumes to have a significant impact. Therefore, this hydrological pathway, and any potential hydrological pathway to additional European Sites located further afield, can be deemed as insignificant by proxy.*
>
> *During the Operational Phase, it has been foreseen that there will be a lack of sources present (as per the source-pathway-receptor (S-P-R) mechanism), in comparison with the Construction Phase. As a result, it has been determined that a significant hydrological pathway between the Site and the nearby European sites may be ruled out during Operational Phase.*
>
> *As a result of the above, it has been determined that there will be no significant hydrological pathway between the Site and Cork Harbour Estuary SPA (004030) and subsequent European Sites which are located at a greater distance from the Site. This conclusion applies to both the construction and operational phases of the Proposed Development….*
>
> *As discussed in the Section above, during Construction Phase, works on Site have the potential to generate sources of pollution. Rather than pollution running overland via the medium of surface water as outlined above, polluted surface water also has the potential to be absorbed into the underlying aquifer, where it may then be transferred horizontally within the underlying bedrock….*
>
> *As highlighted above in Section 4.2.1.1, the majority of the Site is assigned an Extreme groundwater vulnerability status, which entails categorises the ground is as extremely vulnerable to surface water absorption, particularly with the progression of groundworks where much of the surface soil layer will be stripped in preparation for the Proposed Development.*
>
> *However, according to the 'GSI, groundwater flow paths of the Ballinhassig Groundwater Body are expected to be relatively short, typically from 30-300 m, with groundwater discharging to small springs, or to the streams that traverse the aquifer. In summary, owing to the poor productivity of the aquifers in this body, it is unlikely that any major groundwater-surface water interactions occur and baseflow to rivers and streams is likely to be relatively low (GSI, 2004). Therefore, given that the closest European Site, Cork Harbour SPA (004030), is over 6.3km away, this possible hydrogeological pathway is insignificant and can be ruled out.*
>
> *Whilst it is also possible for contaminated ground water to discharge into streams and rivers before hydrological transport to European Sites, the closest stream is 0.37km from the Site which exceeds the 300m threshold of expected hydrogeological travel within this groundwater body. Additionally, following any entry of contaminated water to such streams, transport of contaminated water via the subsequent hydrological pathways to the closest European Site, Cork Harbour SPA (004030), has been deemed insignificant.*
>
> *As such, it is considered that the likely ZOI via hydrogeological pathways is limited to the immediate land adjacent to the Proposed Development Site only and all hydrogeological pathways to European Sites are insignificant.*
>
> *As such, it is considered that the likely ZOI via hydrological pathways is limited to the immediate habitats adjacent to the Proposed Development Site only.*
>
> *The Construction Phase of the Proposed Development could introduce dust and noise impacts transferable via air and land pathways, as well as increased lighting and human activity at the Site and in the vicinity of the Site during the Construction and Operational Phases.*
>
> *The likely ZOI via air and land pathways is considered to be limited to surrounding areas within approx. 200-300m from the Site boundary for any noise and dust sources, depending on prevailing weather conditions. Additionally, light spill is considered to be limited to areas within the Site and habitats immediately adjacent to the boundaries.*
>
> *Given that the closest European Site is approximately 6.3km away from the Site of the Proposed Development, no direct land or air pathways exist to Cork Harbour SPA (004030), or any other European Sites by proxy."*

As such, European sites are not considered further in this Report.

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Table 11.5 European Sites considered with the Source-Pathway-Receptor (S-P-R) method to establish notable links between the sources of effects arising from the Proposed Development, and any European Sites.

Site Name & Site Code	Qualifying Interests (*= priority habitats)	Potential Pathways
	Special Protection Areas (SPAs)	
Cork Harbour SPA Linear Distance to Proposed Development: approx. 6.3km E	As per NPWS (2014) SCI Species • Little Grebe (*Tachybaptus ruficollis*) [A004] • Great Crested Grebe (*Podiceps cristatus*) [A005] • Cormorant (*Phalacrocorax carbo*) [A017] • Grey Heron (*Ardea cinerea*) [A028] • Shelduck (*Tadorna tadorna*) [A048] • Wigeon (*Anas penelope*) [A050] • Teal (*Anas crecca*) [A052] • Pintail (*Anas acuta*) [A054] • Shoveler (*Anas clypeata*) [A056] • Red-breasted Merganser (*Mergus serrator*) [A069] • Oystercatcher (*Haematopus ostralegus*) [A130] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Lapwing (*Vanellus vanellus*) [A142] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Curlew (*Numenius arquata*) [A160] • Redshank (*Tringa totanus*) [A162] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Common Gull (*Larus canus*) [A182] • Lesser Black-backed Gull (*Larus fuscus*) [A183] • Common Tern (*Sterna hirundo*) [A193] • Wetland and Waterbirds [A999] Additional Annex II species as per SDF update 2021 • Mallard (Anas platyrhynchos) [A053] • Gadwall (*Anas strepera*) [A051] • Turnstone (*Arenaria interpres*) [A169] • Pochard (*Aythya ferina*) [A059] • Tufted Duck (*Aythya fuligula*) [A061] • Goldeneye (*Bucephala clangula*) [A067] • Red knot (*Calidris canutus*) [A143] • Ringed Plover (*Charadrius hiaticula*) [A137] • Whooper Swan (*Cygnus cygnus*) [A038] • Coot (*Fulica atra*) [A125] • Black-headed Gull (*Larus ridibundus*) [A179] • Greenshank (*Tringa nebularia*) [A164]	Indirect via a hydrological pathway. Indirect via foul water treatment at Carrigrennan WWTP.

11.10.2.1.1 Potential Impact Pathways

11.10.2.1.1.1 Direct Pathways.

The AA Screening Report prepared by DNV (2025) identified potential direct pathways to European sites as detailed in Table 11-5 above.

These pathways have been screened out for further assessment and are deemed insignificant due to the nature and location of the Proposed Development, which is worth highlighting. Further detail is given in Section 11.10.2.1 above.

11.10.2.1.1.2 Indirect pathways

11.10.2.1.1.2.1 Indirect hydrological pathways

Surface water from the site will be collected and attenuated within the site curtilage, with a peak discharge rate of 2l/s/ha for the 1 in 100 Year rainfall event (including an allowance for climate change). As part of the development, several different SuDS measures will be provided to minimise the impact on water quantity of the runoff. This network ultimately discharges into the public surface water network, as such, a weak indirect hydrological pathway exists between the Site and European Sites within the Lee (Cork) Estuary Upper and Lough Mahon and European Sites within. However, considering the context of the Site, the proposed works, and potential sources of pollution, it is not deemed likely that significant amounts of pollutants would exit the Site into the local surface water network nor create the possibility for significant effects on any European site as a result of this pathway.

As such, it is considered that there this indirect hydrological pathway is insignificant and can be ruled out of further discussion int this report.

11.10.2.1.1.2.2 Ex-Situ Habitat

The majority of the Site currently consists of disturbed land which was previously woodland habitat. The Site, therefore, does not provide suitable ex-situ habitat that is within range of any SCI/QI species of any European Site.

11.10.2.1.1.2.3 Collision Risk

Collision risk and disruptions to migratory pathways are considered in this AA Screening Report, particularly due to the closest European Site, Cork Harbour SPA (004030), supporting populations of various protected bird species. Tall structures such as tall buildings, particularly those with large glass panes with no material variety, can cause perception issues for commuting bird species and subsequently lead to fatal collisions (U.S. Fish and Wildlife Service, 2017). This is particularly true for those species considered to be “poor” fliers, with relatively low manoeuvrability compared to other more agile bird species (see Eirgrid, 2012). Some of the most at-risk groups (classified as ‘medium’ and ‘high’ collision risk species) include wader species; waterfowl such as geese, swan and duck species, and some raptor species. Gulls such as black-headed gull, herring gull and lesser black-backed gull are classed as ‘low’ collision risk species due to their superior manoeuvrability when flying (Eirgrid, 2012).

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However, the closest European Site with SCI/ QI bird species susceptible to such impacts (Cork Harbour Estuary SPA (004030)), is over 6.3km away and is separated from the Site of Proposed Development by an urban landscape of additional multi-storey buildings. Firstly, the range of the bird species most susceptible to collision impacts, predominantly the wetland species, is unlikely to surpass a 6.3km barrier of urban landscape. Where birds from the SPA may reach the Site, these are likely to be more agile species and will be accustomed to traversing other structures of similar height in the vicinity and will therefore not be expected to have to make rapid adjustments in direction or altitude to avoid the Proposed Development.

It should also be noted that during numerous breeding bird surveys conducted at the Site, there was no commuting of any listed bird species within the Site.

As such, indirect air and land pathways via collision risk and migratory disruption deemed insignificant.

According to the Engineering Report for the Proposed Development '*There is also requirement for wastewater network Upgrades, downstream of the proposed development. These upgrade works are understood to be between 160-200m existing Sewer network to 200mm and can be facilitated, with this upgrade to be funded by the developer. Any associated additional works will be carried out in accordance with the connection agreement and in line with Standard details and Code of Practice*'. (OSL, 2025).

11.10.2.2 Relevant Designated Sites

A designated site will only be at risk from likely significant effects where an S-P-R link of note exists between the Proposed Development and the designated site. All designated sites considered as part of the S-P-R method are listed in Table 11-6, and shown in Figure 11-6 and Figure 11-7.

Those sites with notable S-P-R links to the Proposed Development are assessed further in this report as KERs of 'National Importance' (pNHAs and NHAs) or 'International Importance' (SACs/SPAs, UNESCO sites, Ramsar sites).

The nearest designated site to the Proposed Development is the Lee Valley pNHA (000094), located a direct distance of approx. 4.5km north of the Site, on the edge of the river Lee. No direct hydrological pathway exists between this Site and the Site of the Proposed Development. The flow direction, separation distance and distance downstream is such that this pathway is ruled out.

Table 11.6 Showing a complete list of Designated Sites which have been considered with the Source-Pathway-Receptor (S-P-R) method to establish notable links between the source of effects arising form the Proposed Development, and any relevant Designated Sites.

Site Name & Site Code	Designation Rationale	Potential Pathways
Natural Heritage Areas (NHAs)		
There are no Natural Heritage Areas within the zone of influence of the Proposed Development or with a potential pathway to the Proposed Development.		
Proposed Natural Heritage Areas (pNHAs)		
Lee Valley pNHA (000094) Linear Distance to Proposed Development – 4.5km north	There are no formal qualifying interests listed for proposed Natural Heritage Areas.	Screen out due to Linear distance from Proposed Development and lack of hydrological links.
Cork Lough pNHA (001081) Linear Distance to Proposed Development – 3km northeast		Indirect via foul water treatment at Carrigrennan WWTP and discharge into Cork Harbour.
Douglas River Estuary pNHA (001046) Linear Distance to Proposed Development - 6.3km east.		Indirect via foul water treatment at Carrigrennan WWTP and discharge into Cork Harbour.
Ramsar Sites		
Cork Harbour Ramsar Site (Site ID: 837) & IBA Linear Distance to Proposed Development 6.3km east	This Ramsar site also overlaps with the Cork Harbour SPA. "Cork Harbour is part of a sheltered bay system with several river estuaries. The Site consists of four separated intertidal mud and sand flats. The tidal regime is complex, as the mudflats flood and empty rapidly rather than following a normal twelve-hour tidal cycle. These habitats regularly support 20,000 wintering waterbirds, making it one of the top five waterbird sites in Ireland." (Ramsar, 2022). A Site synopsis is available at Ramsar Sites Information Service: https://rsis.ramsar.org/ris/837	Indirect via foul water treatment at Carrigrennan WWTP and discharge into Cork Harbour.

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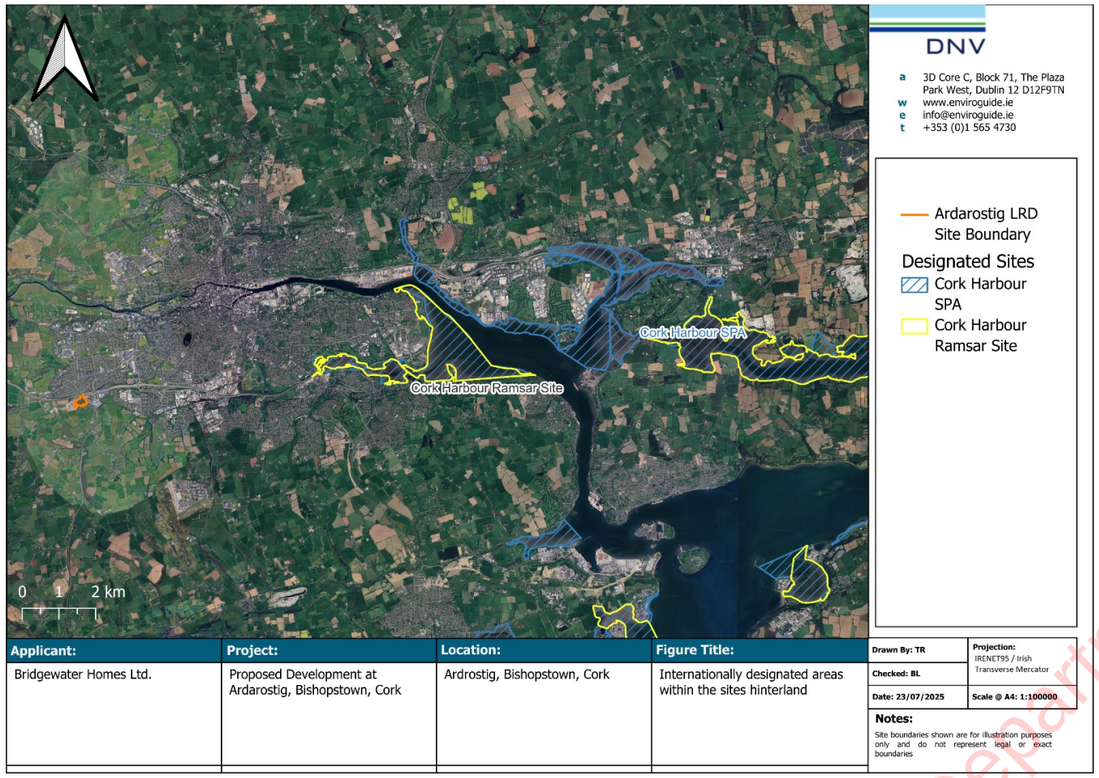


Figure 11.6 Internationally designated sites in relation to the Proposed Development.

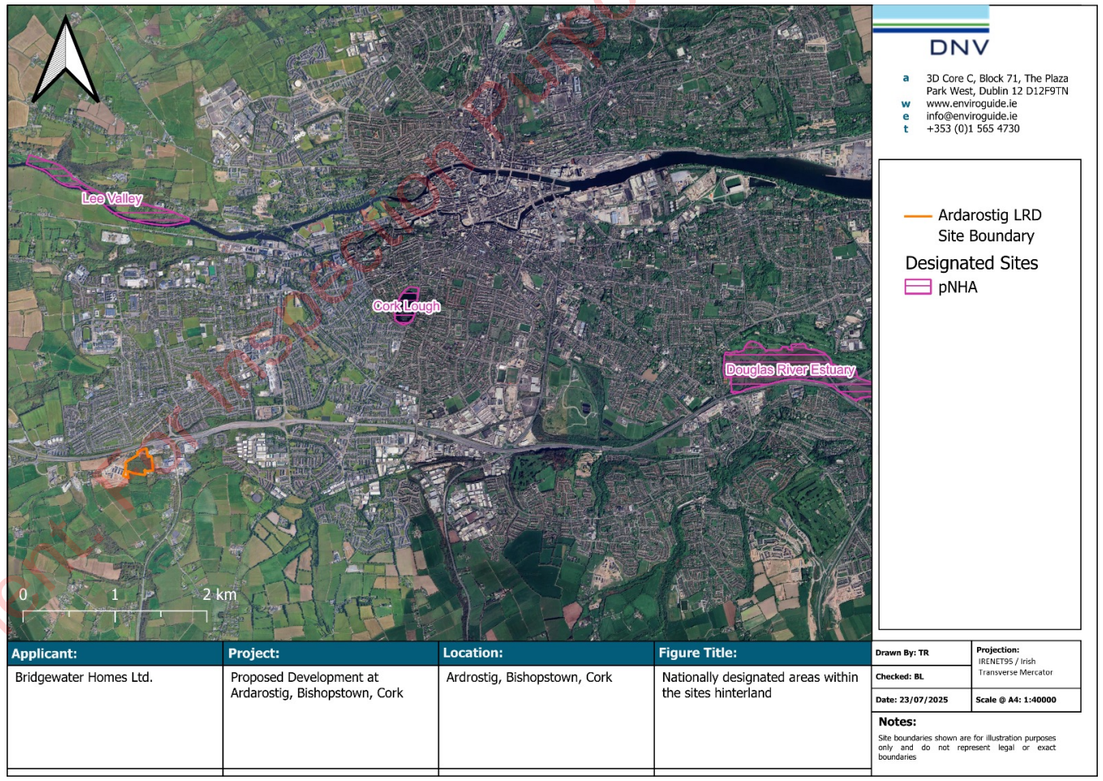


Figure 11.7 Nationally designated sites in relation to the Proposed Development.

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11.10.3 Habitats

The habitats present within the Site, as recorded during field surveys on 11th April 2025, are described below. Site photographs of these habitats are included after each habitat Section and a map of the habitats is presented in Figure 11-18. In summary, habitats recorded on Site during the ecological walkover include:

- WN -Young Woodland
- WS1 - Hedgerows
- WL2 – Treeline
- WS2 – Scrub
- BL3 - Buildings and artificial surfaces
- ED2 – Spoil and bare ground
- WN – Young Woodland (Brash Stockpiles)

Woodland remains in-situ in a very small pocket on the southeast edge. This small area is dominated by mature Willow (Salix sp.) with ash (Fraxinus excelsior) also present. Evidence of young woodland which has been recently cleared via mechanical means has been gathered both via satellite imagery and the on-Site surveys. Plant communities associated with such young woodland areas were present on the Site edges and found to be re-colonising the centre of the Site area within the areas of spoil and bare ground, previously covered by young woodland. It is believed that this young woodland is a relatively recent development, resulting from land-use change c. 2010.

The Site in its current form is comprised mainly of spoil and bare ground (ED2) dominating the open areas of the Site, underlain by sandstone till (EPA, 2025). There are Hedgerows (WL1) separating the southern edge of the Site from the surrounding landscape. Hedgerow also intersperses the Site in a north/south direction. The underlying geology can be described as predominantly 'Coarse loamy drift with siliceous stones' (GSI, 2025).

The Site is bordered on the eastern edge by Treeline (WL2) which lies marginally off Site and is dominated by Beech (*Fagus sylvatica*). An area of scrub remains at the centre of the Site containing bramble, fern species and non-native invasive Sycamore (*Acer pseudoplatanus*).

Areas of artificial surfaces (BL3) span the northern edge of the Site and a hard standing area currently used as a construction Site carpark is also present to the west.

No rare or protected plant species were observed during the ecological walkovers, nor were any protected species records uncovered during the desk study. Each habitat type is described in more detail in the subsequent sections.

It is determined that the Site in its current condition provides 'moderate' suitability for foraging and commuting bats as per Collins (2023 as described in Section 11.10.6 below.

11.10.3.1 Young woodland (WN)

Young woodland shown to be previously present throughout the majority of the Site (Figure 11-8) has been cleared and is now classified as spoil and bare ground (Figure 11-12).

Felled species were dominated by mature Willow as identified on Site. (Figure 11-8). Young Willow woodland can provide for a variety of species including birds, mammals, amphibians and numerous invertebrate and insect species. This woodland also plays a key role as a wildlife corridor and refuge.

The total area of woodland prior to clearance was approximately 4.2 hectares (ha). Using aerial imagery and historical land use maps, the area of young woodland was in agricultural use prior to land abandonment c. 2006, making the young woodland c. 18 years old prior to clearance. This is consistent with the observed evidence of trees within this age category stockpiled on Site. There remains a small area of woodland c. 0.05-0.06 ha at the southeast corner which will also be lost during the construction phase.

This habitat prior to removal would have been categorised as being of **local importance – higher value**. The area which is now largely categorised as spoil and bare ground with common regenerating plant communities is of **local importance – lower value**.



Figure 11.8 Cleared young woodland stockpiled on Site

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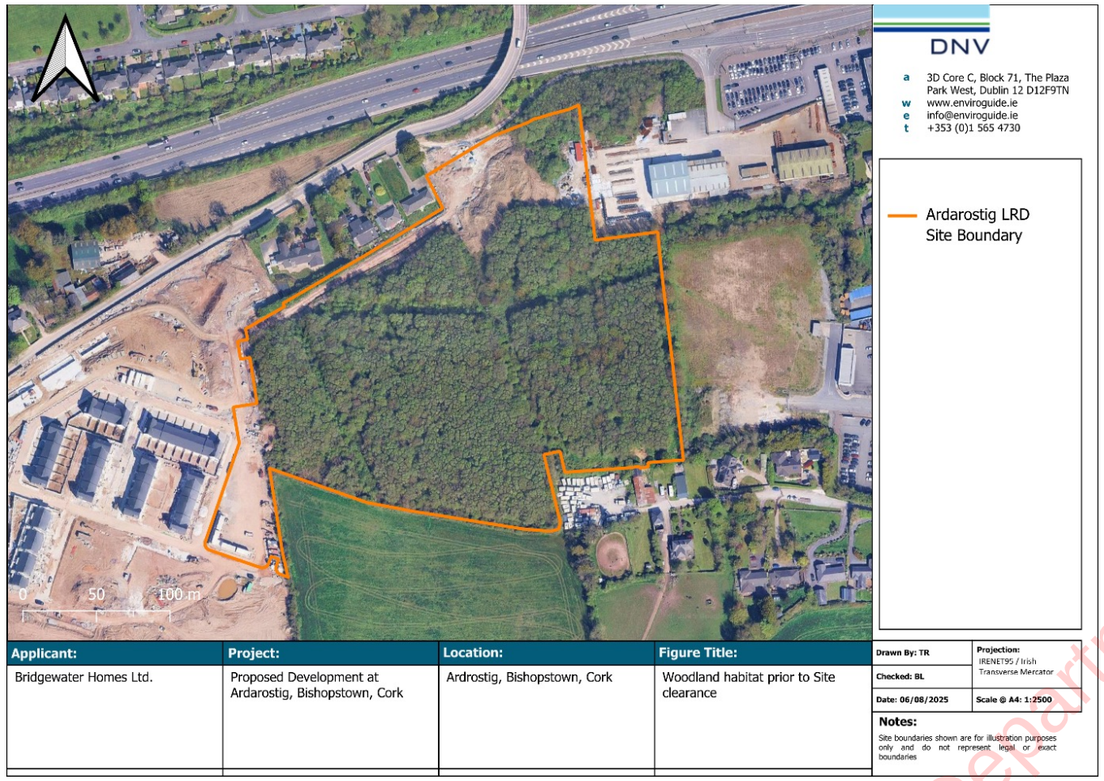


Figure 11.9 Aerial imagery showing original young woodland habitats present on Site prior ro Site clearance (2024).



Figure 11.10 Aerial imagery showing early colonisation of young woodland post land-use change (c.2006)

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Figure 11.11 Plant communities typically associated with woodland present on Site



Figure 11.12 ED2 Spoil and bare ground (current Site condition, April 2025)

11.10.3.2 Hedgerows (WS1)

Hedgerows are present on the periphery and intersect the footprint of the Site. They are of good ecological quality (i.e. tall, wide and largely unmanaged, supporting a greater variety of species when compared to narrow more intensively managed hedgerows with a variety of common species such as bramble, blackthorn (*Prunus spinosa*) and hawthorn (*Crataegus monogyna*). A standalone Hedgerow Appraisal of the hedgerows on Site has been carried out and is detailed in 11.10.9.

As a result of the hedgerow survey, a total of nine hedgerows and treelines were assessed for their condition (Figure 11-28). Note that the areas of woodlands shown, which existed until 2024 as per the historical satellite image of Google Earth (2025), had already been cleared at the time of the survey.

The results of the assessment for each hedgerow/treeline are shown in the following sections. Further details for the assessments, flora and photo data are provided in Appendix 11.1.

The hedgerows present are of **local importance – higher value**.



Figure 11.13 Hedgerow Habitat

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11.10.3.3 Treeline (WL2)

Treelines are present along the fringes of the Site. The Site is bordered on the eastern edge by Treeline (WL2) which lies marginally off Site.

"*Dominant tree species within the hedgerow were lime (*Tilla *spp.) in the tree layer (> 5m) and hawthorn (Crataegus monogyna) in the shrub layer alongside occasional dog rose* (*Rosa canina agg.), wych elm (*Ulmus glabra*), elder (*Sambucus nigra*) and horse-chestnut (Aesculus hippocastanum).*" (DNV, 2025).

Treeline is also present on the northwestern Site boundary and is dominated by *Cypress leylandii* species bordering onto neighbouring garden areas off Site. High impact invasive species cherry laurel (*Prunus laurocerasus*) was found to be present within both treelines.

Treelines on Site are of **local importance – higher value.**



Figure 11.14 Treeline (WL2)

11.10.3.4 Scrub (WS1)

An area of scrub remains at the centre of the Site containing bramble, fern species and non-native invasive sycamore. Also present is Horse Chestnut (*Aesculus hippocastanum*) and Birch (*Betula sp*.) saplings. Due to the limit area and low species diversity, this habitat is of **local importance – lower value**.

11.10.3.5 Buildings and artificial surfaces (BL3)

Roadway and hard standing is present on the northern and western Site edges and are in current use for haulage and car parking purposes. These areas are of **negligible** importance ecologically.



Figure 11.15 Buildings and artificial surfaces

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11.10.3.6 Spoil and bare ground (ED2)

Spoil and bare ground (ED2) dominate most of the Site footprint showing early re colonizing plant species. On the edges are plants including groundsel (*Asteraceae*), field thistle (*Cirsium arvense*), common figwort (*Scrophularia nodosa*), coltsfoot (*Tusilago farfara*), scarlet pimpernel (*Anagallis arvensis*) and lords and ladies (*Arum maculatum*). This habitat is of **negligible** ecological importance locally



Figure 11.16 Spoil and bare ground

11.10.3.7 Young Woodland (WD Brash Stockpiles)

Stockpiles of cleared wood remain on Site following the clearance of young woodland. (Figure 11-17). These stockpiles contain suitable habitat for nesting bird species and hibernating species such as common lizard and common frog. This habitat is of **local importance – higher value**.



Figure 11.17 Brash Stockpiles scattered throughout the Site

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11.10.3.8 Dry Stone Wall (BL1)

A dry stone wall is contained within the hedgerow intersecting the Site in a north/south direction. The wall is partially visible through the buildup of clay and vegetation. This habitat provides suitable habitat for amphibians and common lizard and is classed as being of **local importance – higher value**.

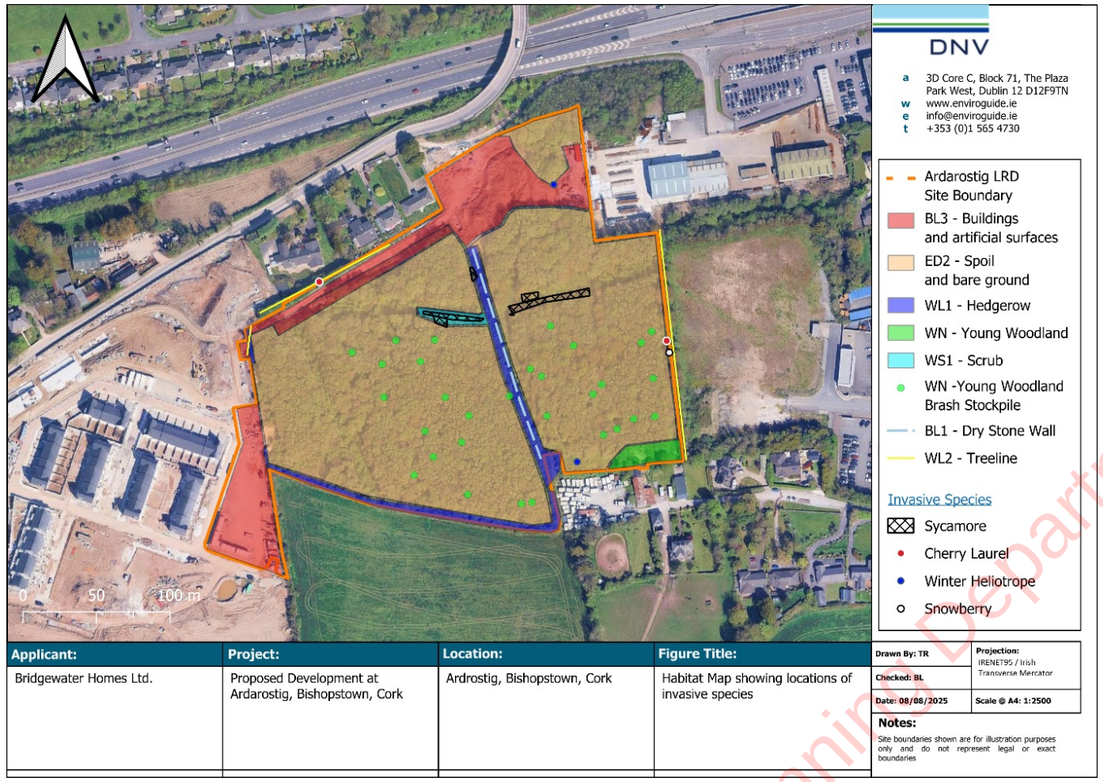


Figure 11.18 Habitat Map

11.10.4 Flora

11.10.4.1.1 Rare and Protected Flora

The Site of the Proposed Development is located within the Ordnance Survey 10km Grid Square (W66) and 2km Grid Square (W66J). Species records from the NBDC online database for these grid squares were studied for the presence of rare and/or protected species within the last 20 years. No rare or protected floral species were recorded during the Site visits and species records for the surrounding areas over the past 20-year period are detailed in Table11-7 below.

Table 11.7 Flora species records

Species	Grid square	Date of last record	Source	Designations/Location relative to the Proposed Development
Cornflower (*Centaurea cyanus*)	W66	18/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Waiting list. 6km east
Greater Knapweed (*Centaurea scabiosa*)	W66	18/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Near threatened. 6km east
Little-robin (*Geranium purpureum*)	W66	17/05/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Endangered. 4km northeast
Meadow Crane's-bill (*Geranium pratense*)	W66	18/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Vulnerable 6km east
Round-leaved Crane's-bill (*Geranium rotundifolium*)	W66J	25/05/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Endangered. 500m southeast
Vervain (*Verbena officinalis*)	W66J	25/06/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Near threatened. 2.5km northeast

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11.10.4.2 Invasive Species

Several records of invasive species exist for the 2km Grid Square (W66J) encompassing the Site and are referenced in Table 11-8 below.

Table 11.8 Invasive species records (NBDC Database) from the W66J 2km grid square encompassing the Site.

Species	Grid square	Date of last record	Source	Designations/ Location relative to the Proposed Development
Canadian Waterweed (*Elodea canadensis*)	W66J	24/07/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland) >500m northwest.
Japanese Knotweed (*Reynoutria japonica*)	W66J	14/11/2024	National Invasive Species Database	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland) 500m southeast.
Sycamore (Acer pseudoplatanus)	W66J	25/10/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species
Traveller's-joy (Clematis vitalba)	W66J	29/05/2016	National Invasive Species Database	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species
Water Fern (Azolla filiculoides)	W66J	08/08/2012	National Invasive Species Database	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Brazilian Giant-rhubarb (Gunnera manicata)	W66J	18/06/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)

11.10.4.3 Field Study Results

The ecological walkover completed by DNV on the 11th April 2025 recorded two invasive non-native species listed on schedule III of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011) within the Proposed Development Site.

Sycamore (*Acer pseudoplatanus*), a Medium-impact invasive species was present within scrub at the centre of the Site and is colonising areas throughout the Site. Winter Heliotrope (*Petasites pyrenaicus*) a medium-impact invasive, was present to the north of the Site during the ecological walkover. Snowberry (*Symphoricarpos albus*) which is a low-impact invasive species was recorded on Site. As outlined in the Hedgerow Appraisal survey results, high- impact cherry laurel was also present in two location of the Site (Figure 11-18).

11.10.5 Non-volant Mammals (excl. bats)

11.10.5.1 Desk Study Results

Records for terrestrial mammals were obtained from the NBDC online database. Table 11-9 lists these species, their date of last record and summarises their protected status/designation. A total of four native terrestrial mammals were recorded in the surrounds of the Site, none of which were observed on Site. Three non-native / invasive mammals were recorded during the desk study.

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Table 11.9 Records of terrestrial mammals (Native and Non-Native) for the surrounding 2km (W66J) Grid Square associated with the Site (NBDC)

Species	Grid square	Date of last record	Source	Designations/ Location relative to the Proposed Development
NATIVE SPECIES				
Otter *(Lutra lutra*)	W66J	29/02/2012	Atlas of Mammals in Ireland 2010-2015	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex II || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts. 1km – 1.2km south and northwest.
Badger (*Meles meles)*	W66J	31/12/2014	Badger Setts of Ireland Database	Protected Species: Wildlife Acts. >1km south
Hedgehog (*Erinaceus europaeus)*	W66J	26/08/2021	Hedgehogs of Ireland	Protected Species: Wildlife Acts 400m northwest
Red Squirrel (*Sciurus vulgaris)*	W66J	14/08/2018	Mammals of Ireland 2016-2025	Protected Species: Wildlife Acts 400m northwest.
Invasive Non-Native Species				
Ferret (*Mustela putorius subsp. furo)*	W66J	26/02/2008	National Feral Ferret (Mustela putoris furo) Database	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species. 0-1km north.
Coypu (*Myocastor coypus)*	W66J	06/06/2017	National Invasive Species Database	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> EU Regulation No. 1143/2014 || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland) 1km northwest, Curragheen River
Rabbit (*Oryctolagus cuniculus)*	W66J	17/02/2014	Atlas of Mammals in Ireland 2010-2015	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species. 200m east.

11.10.5.2 Field Survey Results

During the ecological walkover of the Site on the 11th of April 2025, the Site was checked for any evidence of fauna presence/ activity on Site. There was no direct evidence of protected terrestrial mammals, however the Site contains potentially suitable commuting, foraging and resting habitat for small mammals such as Hedgehog (*Erinaceus europaeus*), Irish Stoat (*Mustela erminea Hibernica)* and Pine Marten (*Martes martes*).

The medium impact European rabbit was present throughout the survey period of 2025.

It is noted that there are no suitable waterbodies located within or directly adjacent to the Proposed Development Site capable of supporting aquatic mammals such as Otter.

11.10.6 Bats

11.10.6.1 Desk Study Results

There are no records for bat species on Site or within the 2km grid square (W66J) encompassing the Site. The 10km grid square (W66) that encompasses the entire Site holds records for six bat species (NBDC, 2025) (Table 11-10).

Table 11.10 Records of bats for the surrounding 10km Grid squares (W66) which encompass the Site (NBDC)

Species	Grid square	Date of last record	Source	Designations
Brown Long-eared Bat (*Plecotus auritus*)	W66	15/08/2017	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto)*	W66	20/08/2019	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Daubenton's Bat (*Myotis daubentonii)*	W66	13/10/2015	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Leisler's Bat (*Nyctalus leisleri)*	W66	20/08/2019	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Pipistrelle (*Pipistrellus pipistrellus sensu lato)*	W66	30/07/2019	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Soprano Pipistrelle (*Pipistrellus pygmaeus)*	W66	20/08/2019	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts

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The Proposed Development Site (indicated in the black box in Figure 11-19) is located in an area with an overall Medium-High (29.56) suitability for bats in general.



Figure 11.19 Bat Landscape Suitability Model (All bats) surrounding the Proposed Development Site (Adapted from NBDC).

11.10.6.2 Field Survey Results

11.10.6.2.1 Habitat Appraisal

Habitats on Site were assessed during the desk study, and during field surveys in April 2025. Habitats were assessed for their ability to support foraging and commuting bats, as well as the Site's connectivity to the wider landscape. A range of factors are considered in making this assessment according to Collins (2023), such as the connectivity of the Site to the wider landscape by means of treelines, hedgerows, and river corridors, the size, quality and species composition of treelines and hedgerows on Site, and the presence of any barriers to commuting for bat species.

It is determined that the Site in its current condition provides 'moderate' suitability for foraging and commuting bats as per Collins (2023).

The presence of natural and semi-natural habitats on Site and on the edges are considered important to bats in a local context both for foraging and commuting. Due to the nature of the Proposed Development, areas of moderate importance for local bat species are almost entirely retained and will remain intact during the construction and operational phases of the Proposed Development, however the design of the Proposed Development in line with best practice and with adequate cognisance of nocturnal wildlife (including bats) will be important to the integrity of the current suitable habitat/ landscape.

11.10.6.2.2 Preliminary Bat Roost Assessment

During the Site visit in April 2025, a preliminary bat roost assessment was conducted on all trees where relevant within the Site.

No notable roosting potential was observed on any of the trees on Site during the initial Site visit, or any subsequent Site visits. The are no buildings present within the Site boundary. Therefore, the Site was categorised as having 'negligible' potential for roosting bat species as per Collins (2023).

11.10.6.2.3 Bat Activity Surveys (NBW)

Three dusk activity surveys were conducted at the Site. Weather was suitable for surveys according to the guidance outlined in Collins (2023).

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11.10.6.2.3.1 NBW Survey 1 – 22nd May 2025

Activity was recorded on the Site periphery, with concentrations of bats located along linear features such as hedgerows and treelines. Bat passes and species composition for this survey are shown in Table 11-11 and Figure 11-20 respectively. A map of recorded bat activity and the transect route is shown in Figure 11-21.

Table 11.11 Summary of bat activity recorded on Site – 22nd May 2025

Species	Species Latin Name	Number (n) of Calls [#]	% of Total Calls
Common Pipistrelle	*Pipistrellus pipistrellus*	172	75.1
Soprano popostrelle	*Pipistrellus pygmaeus*	22	9.6
Lesiler's bat	*Nyctalus leisleri*	4	1.7
	Total	229	100.0

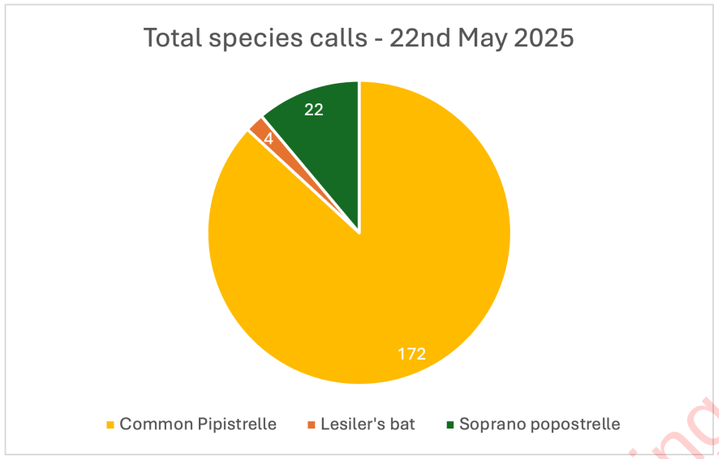


Figure 11.20 Species composition – 22nd MAY 2025.

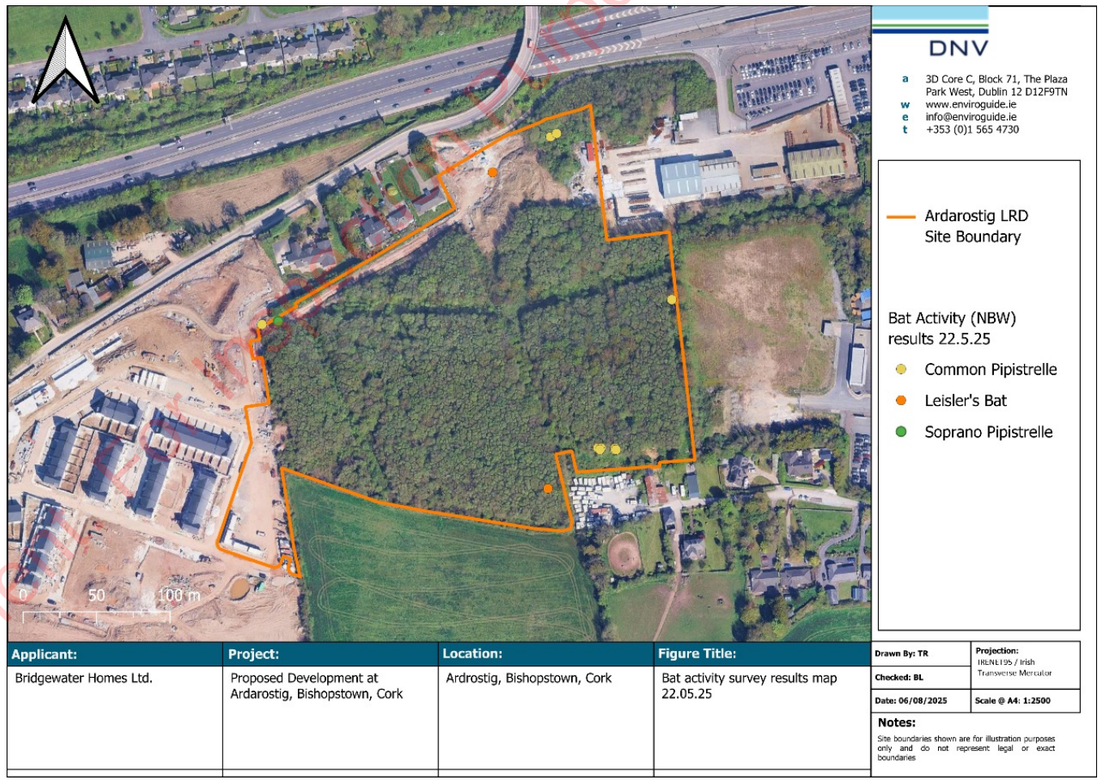


Figure 11.21 Bat activity results map 22nd May 2025

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11.10.6.2.3.2 NBW Survey 2 – 2nd July 2025

Activity was recorded on the Site periphery with concentrations of bats located along linear features such as hedgerows and treelines. Bat passes and species composition for this survey are shown in Table 11-12, Figure 11-22 and Figure 11-23 respectively.

Table 11.12 Summary of bat activity recorded on Site – 2nd July 2025

Species	Species Latin Name	Number (n) of Calls [#]	% of Total Calls
Common Pipistrelle	*Pipistrellus pipistrellus*	455	95.2
Soprano popostrelle	*Pipistrellus pygmaeus*	21	0.4
Lesiler's bat	*Nyctalus leisleri*	2	4.4
	Total	478	100.0

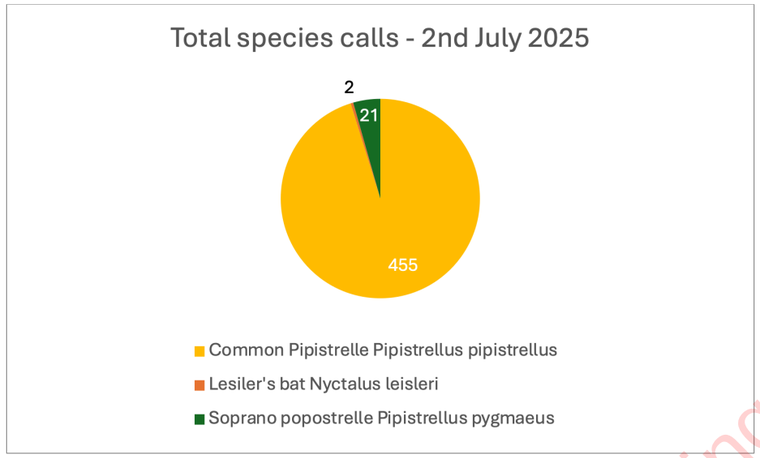


Figure 11.22 Species composition 2nd July 2025.

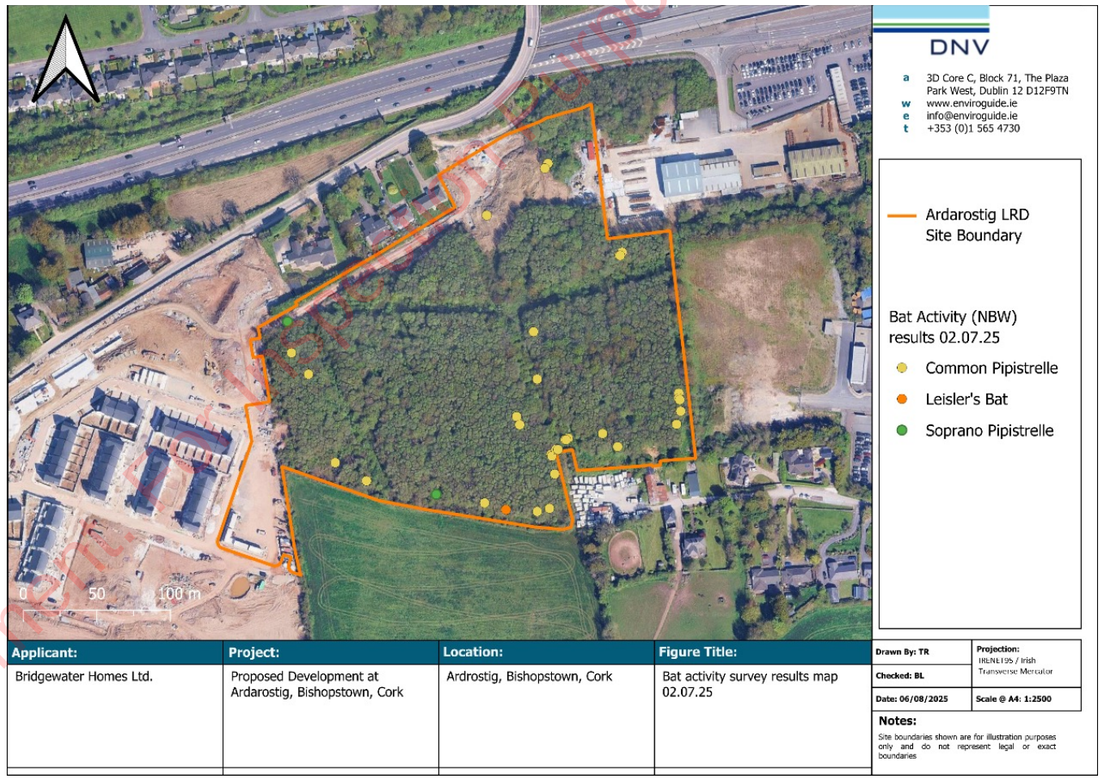


Figure 11.23 Bat activity survey results map 2nd July 2025

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11.10.6.2.3.3 NBW Survey 3 – 15th July 2025

Activity was recorded on the Site periphery with concentrations of bats located along linear features such as hedgerows and treelines. Bat passes and species composition for this survey are shown in Table 11-13,Figure 11-22 and Figure 11-25 respectively. Bat activity survey results have shown the treeline bordering the eastern boundary to be an important foraging and commuting habitat for bats locally.

Table 11.13 Summary of bat activity recorded on Site – 15th July 2025

Species	Species Latin Name	Number (n) of Calls [#]	% of Total Calls
Common Pipistrelle	*Pipistrellus pipistrellus*	365	75.6
Lesiler's bat	*Nyctalus leisleri*	54	11.2
Soprano popostrelle	*Pipistrellus pygmaeus*	64	13.3
	Total	483	100.0

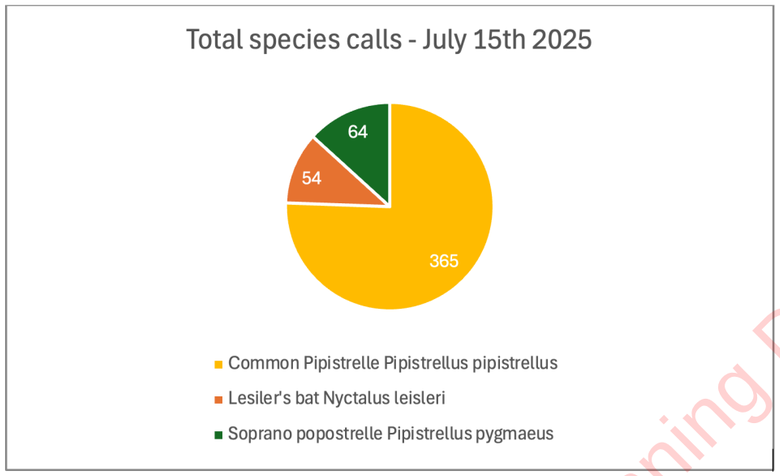


Figure 11.24 Species composition on 15th July 2025.

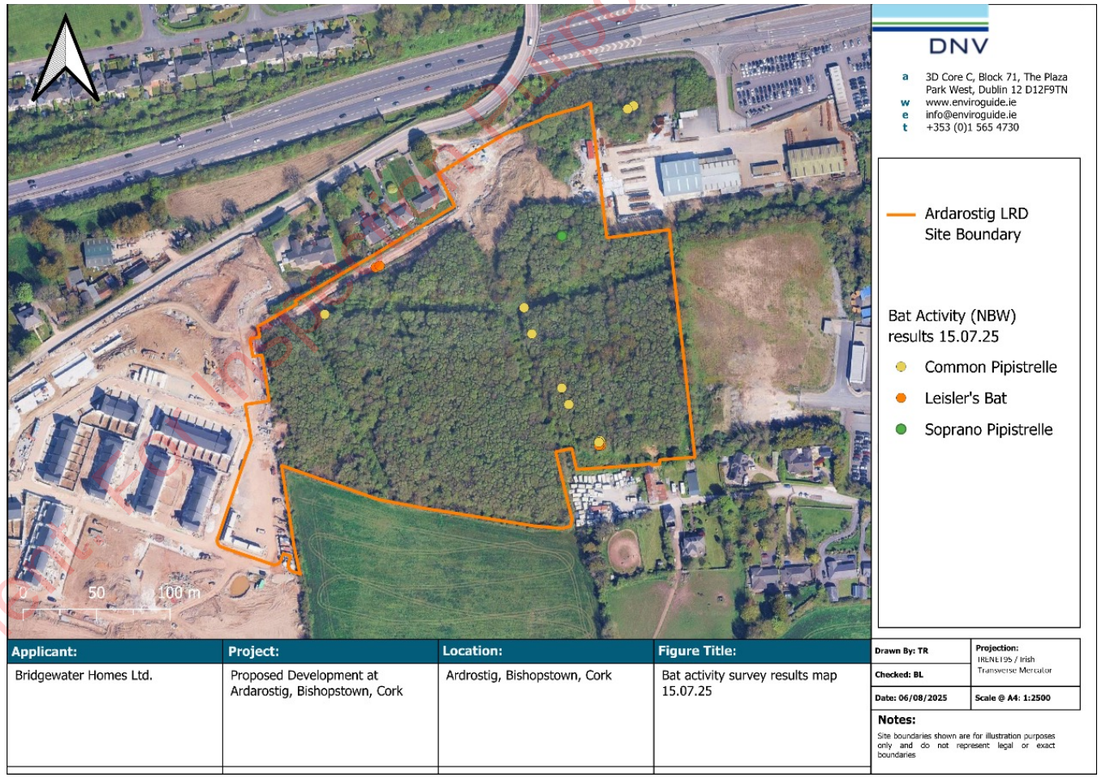


Figure 11.25 Bat activity survey results map 15th July 2025

11.10.6.2.4 Static Detector Monitoring

Static detector monitoring was conducted for 3 periods of a minimum of five nights each. Details of which are shown in Table 11-14.

Table 11.14 Static detector monitoring effort.

Date	Survey Type	Approximate recording times
29 May – 3 June 2025	Static detector monitoring	21:09 – 05:35
21 July – 28 July 2025	Static detector monitoring	21:07 – 05:56
31 July – 5 August 2025	Static detector monitoring	20:51 – 06:11

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11.10.6.2.4.1 Static Detector Monitoring Period 1 – 29 May – 3 June 2025

One static detector was placed on Site for a period of 6 nights. The location of static detectors is displayed in Figure 11-4. Bat passes and species composition for this monitoring period are shown in Table 11-15, 11-26 and 11-27 respectively.

Common pipistrelle (*Pipistrellus pipistrellus*) (n=610) was the most frequently recorded species, comprising 86% of bat passes. Soprano pipistrelle (*Pipistrellus pygmaeus*) (n=50) was second at 7%, followed by Leisler's bat (*Nyctalus leisleri*) (n=31) at 4%. Brown long-eared bat (*Plecotus auritus*) (n=9) and Nathusius' pipistrelle (*Pipistrellus nathusii*) (n=6) were rarely recorded, each accounting for less than 1% of passes.

Table 11.15 Summary of bat activity recorded on Site during static detector monitoring period 1.

Species	Bat Passes
Brown long eared bat	9
Common pipistrelle	610
Leisler's bat	31
Nathusius pipistrelle	6
Soprano pipistrelle	50

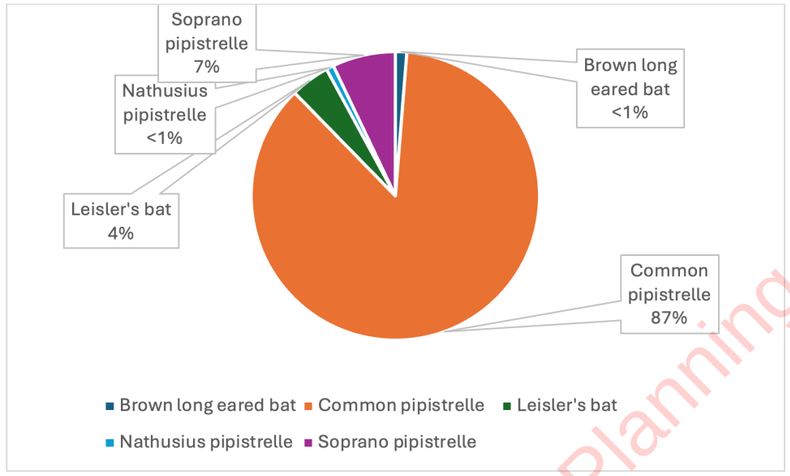


Figure 11.26 Species composition during static detector monitoring period 1

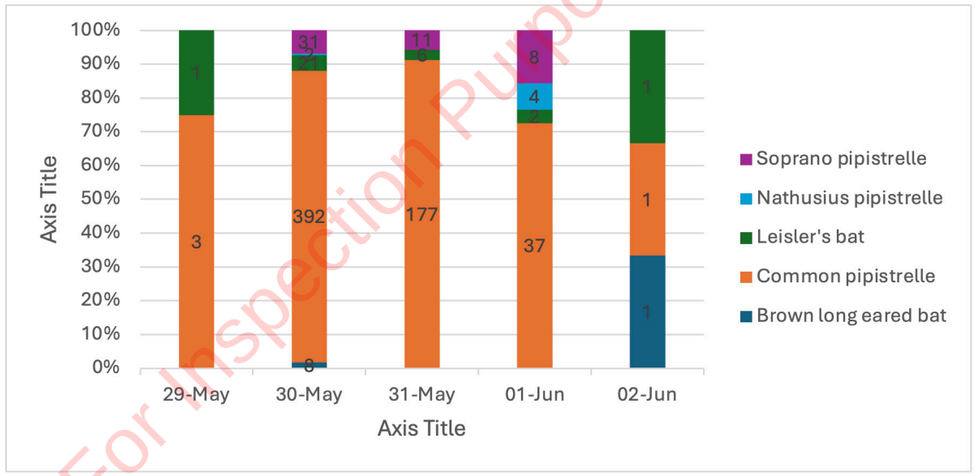


Figure 11.27 Species recordings per night from 29 May – 3 June 2025.

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11.10.6.2.5 Static Detector Monitoring Period 2 – 21 July – 28 July 2025

One static detector was placed on Site for a period of 8 nights. Bat passes and species composition for this monitoring period are shown in 11-16 and Figure 11-28 respectively.

Common pipistrelle (*Pipistrellus pipistrellus*) (n=2210) was the most frequently recorded species, comprising 83% of bat passes. Soprano pipistrelle (*Pipistrellus pygmaeus*) (n=213) was next at 8%, followed by Leisler's bat (*Nyctalus leisleri*) (n=202; 8%). Nathusius' pipistrelle (*Pipistrellus nathusii*) (n=15) was again a very rare occurrence accounting for less than 1% of calls, as were *Myotis* spp. (n=7) and brown long-eared bat (*Plecotus auritus*) (n=6) also accounting for <1% of calls.

Table 11.16 Summary of bat activity recorded on Site during static detector monitoring period 2.

Species	Bat Passes
Brown long eared bat	6
Common pipistrelle	2210
Leisler's bat	202
Myotis spp.	7
Nathusius pipistrelle	15
Soprano pipistrelle	213

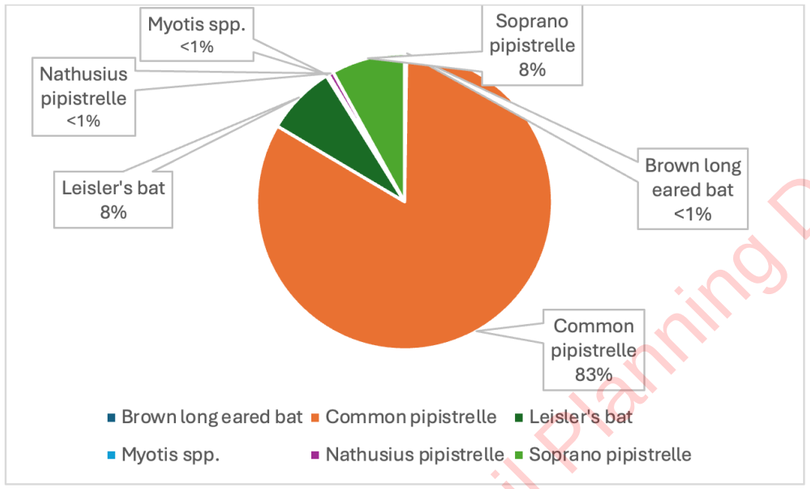


Figure 11.28 Species composition during static detector monitoring period 2.

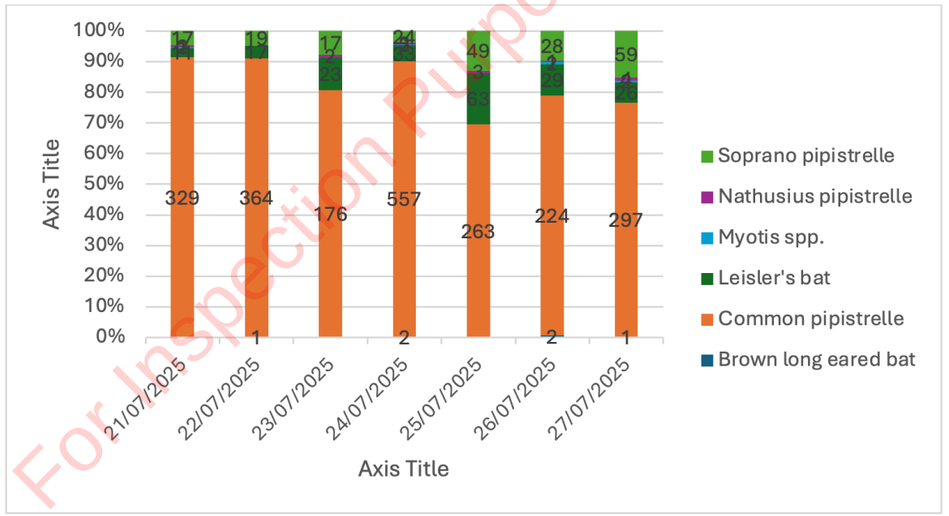


Figure 11.29 Species recordings per night from 21 July – 28 July 2025.

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11.10.6.2.6 Static Detector Monitoring Period 1 – 31 July – 5 August 2025

One static detector was placed on Site for a period of 6 nights. Bat passes and species composition for this monitoring period are shown in Table 11-17, Figure 11-30 and Figure 11-31 respectively.

Common pipistrelle (*Pipistrellus pipistrellus*) (n=1292) was the most frequently recorded species, comprising 81% of bat passes. Soprano pipistrelle (*Pipistrellus pygmaeus*) (n=196) followed at 12%, with Leisler's bat (*Nyctalus leisleri*) (n=102; 6%) next. Myotis spp. (*Myotis* spp.) (n=5; <1%) and brown long-eared bat (*Plecotus auritus*) (n=2; <1%) were recorded infrequently.

Table 11.17 Summary of bat activity recorded on Site during static detector monitoring period 3.

Species	Bat Passes
Brown long eared bat	2
Common pipistrelle	1292
Leisler's bat	102
Myotis spp.	5
Soprano pipistrelle	196

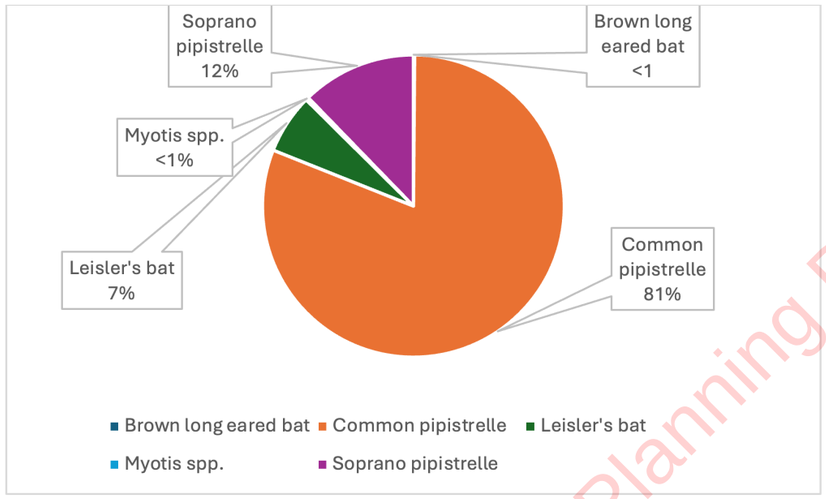


Figure 11.30 Species composition during static detector monitoring period 3.



Figure 11.31 Species recordings per night from 31 July – 5 August 2025.

11.10.7 Birds

11.10.7.1 Preliminary Bird Survey Results

During the Preliminary Ecological Appraisal Site visit on the 11thApril 2025, a number of birds were recorded and assigned breeding status. These results have been combined with the Breeding Bird Survey results which were obtained from the Bird specific surveys undertaken thereafter in 2025. See Section 11.10.7.2 below with Table 11-18, Table 11-19, and Figure 11-32 showing all target species records.

Non-target species are outlined in Appendix 11.4

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11.10.7.2 Desk Study Results

A total of ten bird species which are listed on the BoCCI red and amber lists have been recorded within the W66J 2km grid square. Of these, six are red-listed and four are Amber-listed as referenced by the Birds of Conservation Concern in Ireland 2020-2026 (Gilbert et al., 2021) (Table 11-18).

Table 11.18 Details of EU Annex I, BoCCI Amber and BoCCI Red-listed species recorded within the 2km grid square (W66J) (NBDC,2025)

Species Name	Date of Last Record	Title of Dataset	Conservation Status BoCCI, Birds Directive
Swift (*Apus apus*)	03/06/2020	Birds of Ireland	BoCCI Red List
Shoveler (*Spatula clypeata)*	19/05/2020	Birds of Ireland	BoCCI Red List
Redwing (*Turdus iliacus)*	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Red List
Red Kite *(Milvus milvus)*	29/06/2021	Birds of Ireland	BoCCI Red List
Kestrel (*Falco tinnunculus)*	17/04/2020	Birds of Ireland	BoCCI Red List
Grey Wagtail (*Motacilla cinerea)*	11/05/2019	Birds of Ireland	BoCCI Red List
Kingfisher *(Alcedo atthis)*	04/04/2015	Birds of Ireland	BoCCI Amber List
Swallow *(Hirundo rustica)*	11/04/2019	Birds of Ireland	BoCCI Amber List
Mallard (*Anas platyrhynchos)*	19/05/2020	Birds of Ireland	BoCCI Amber List
Cormorant (*Phalacrocorax carbo)*	31/03/2020	Birds of Ireland	BoCCI Amber List

11.10.7.3 Breeding Bird Survey Results

A total of 24 no. bird species were recorded during breeding bird surveys, the majority of which were recorded within the Proposed Development area. Breeding activity was recorded for several common and Green-listed species (Appendix 11.4).

Seven (7 no.) species of medium – high conservation concern were recorded during breeding bird surveys and are detailed in Table 11-19 and Figure 11-32 below.

Table 11.19 Breeding Bird Survey Results. Including results from Preliminary Ecological Appraisal Field Visit

GIS-MAP-CODE	Date	Species-common-name	*Species-latin-name*	Conservation-Status-BoCCI	Breeding Status	No.-Recorded
SH 004	08/07/2025	Sparrowhawk	*Accipiter nisus*	Green	Confirmed breeding	*1*
SH 003	08/07/2025	Sparrowhawk	*Accipiter nisus*	Green	Probable breeding	*1*
SH 002	24/06/2025	Sparrowhawk	*Accipiter nisus*	Green	Probable breeding	*1*
SH 001	24/06/2025	Sparrowhawk	*Accipiter nisus*	Green	Probable breeding	*1*
BZ 003	15/07/2025	Buzzard	*Buteo buteo*	Green	Probable breeding	*2*
BZ 002	08/07/2025	Buzzard	*Buteo buteo*	Green	Probable breeding	*1*
GC 006	08/07/2025	Goldcrest	*Regulus regulus*	Amber	Probable breeding	*1*
GC 005	08/07/2025	Goldcrest	*Regulus regulus*	Amber	Probable breeding	*1*
GC 004	08/07/2025	Goldcrest	*Regulus regulus*	Amber	Probable breeding	*1*
GC 002	29/05/2025	Goldcrest	*Regulus regulus*	Amber	Probable breeding	*1*
GC 001	11/04/2025	Goldcrest	*Regulus regulus*	Amber	Probable breeding	*1*
BZ 004	15/07/2025	Buzzard	*Buteo buteo*	Green	Possible breeding	*1*
BZ 001	11/04/2025	Buzzard	*Buteo buteo*	Green	Possible breeding	*3*
SL 004	08/07/2025	Swallow	*Hirundo rustica*	Amber	Non-breeding	*3*
SL 003	08/07/2025	Swallow	*Hirundo rustica*	Amber	Non-breeding	*3*
SL 002	24/06/2025	Swallow	*Hirundo rustica*	Amber	Non-breeding	*2*
SL 001	29/05/2025	Swallow	*Hirundo rustica*	Amber	Non-breeding	*3*
SI 001	24/06/2025	Swift	*Apus apus*	Red	Non-breeding	*3*
SG 001	08/07/2025	Starling	*Sturnus vulgaris*	Amber	Non-breeding	*5*
HM 001	08/07/2025	House martin	*Delichon urbicum*	Amber	Non-breeding	1

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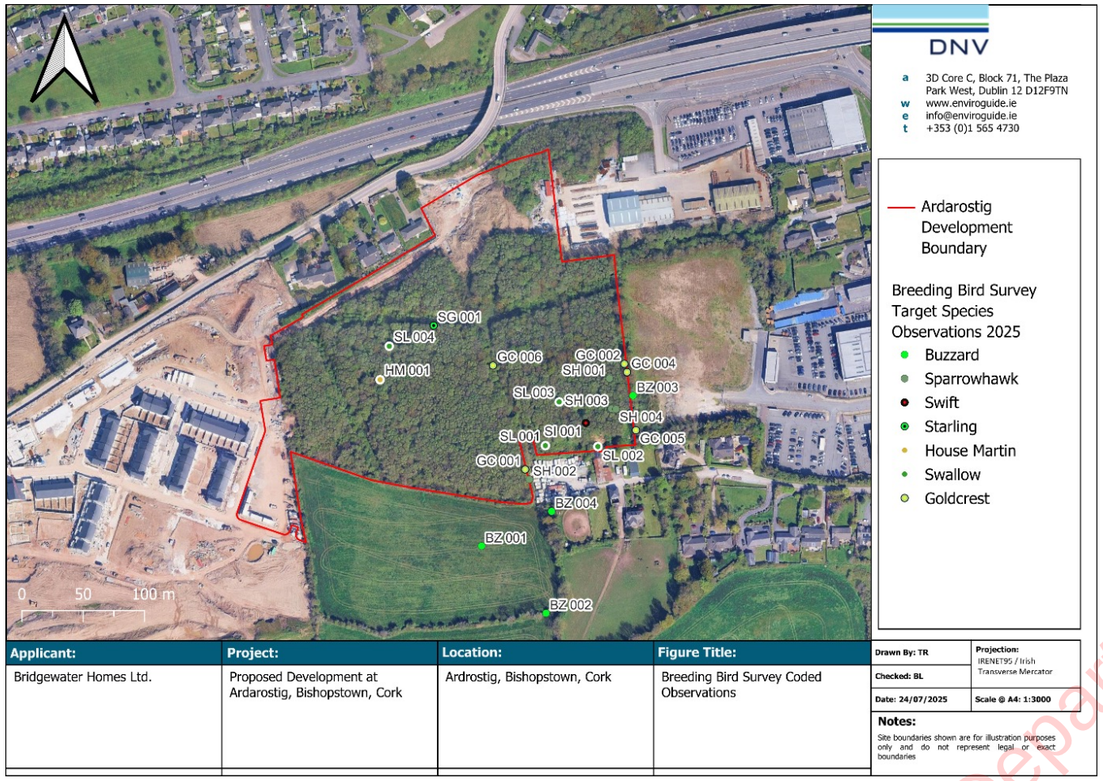


Figure 11.32 Breeding Bird Survey Observations (Target Species)

11.10.7.3.1 Sparrowhawk (***Accipiter nisus)*** (BoCCI Green List)

Sparrowhawk was found to be breeding in the area. Breeding behaviour including the carrying of prey items towards an off-site nesting area. The exact nesting location was not located, and the behaviour of the adult birds is strongly suggestive of an active nest Site within the vicinity of the Site, in the areas surrounding the southeast boundary.

11.10.7.3.2 Buzzard (***Buteo buteo***) (BoCCI Green List)

Buzzard was found to be a probable breeder in the area. Breeding behaviour including territorial calling was recorded on most Site visits, including the preliminary ecological walkover. The exact nesting location was not located and it can be confirmed that the species did not use the areas within the Site boundary for breeding during the 2025 survey period. The behaviour of the adult birds is strongly suggestive of an active breeding territory within the broader hinterland of the Site, in the mixed agricultural areas beyond the southern boundary.

11.10.7.3.3 Goldcrest (***Regulus regulus)*** (BoCCI Amber List)

Goldcrest was recorded on all Site visits and is classed as a probable breeding species. The treelined and hedgerow habitats were found to occupy birds which were exhibiting breeding behaviour and it is likely breeding occurred in these areas of the Site as displayed in Figure 11-32 above.

11.10.7.3.4 Swallow (***Hirundo rustica)*** (BoCCI Amber List)

Swallow was regularly observed foraging over the Site area and no breeding areas were found during surveys. There is an absence of suitable breeding areas for this species within the confines of the Site.

11.10.7.3.5 Swift (Apus apus) (BoCCI Red List)

Swift was found to be in flight high over the Site during June bird surveys. There is an absence of suitable breeding areas for this species within the confines of the Site.

11.10.7.3.6 Starling (Sturnus vulgaris) (BoCCI Amber List)

Starling was found to be in flight high over the Site during July bird surveys. There is an absence of suitable breeding areas for this species within the confines of the Site and the species is likely to have been foraging and/or passing over the area..

11.10.7.3.7 House Martin (Delichon urbicum) (BoCCI Amber List)

Starling was found to be in flight high over the Site during July bird surveys. There is an absence of suitable breeding areas for this species within the confines of the Site and the species is likely to have been foraging and/or passing over the area..

11.10.7.3.8 Summary of Other Bird Species Recorded

In addition to the target species outlined above, a total of 17 Green-listed species were recorded on Site. These species included Blackcap (*Sylvia atricapilla*), Blackbird (*Turdus merula*), Blue Tit (*Cyanistes caeruleus*), Chiffchaff (*Phylloscopus collybita*), Dunnock (*Prunella modularis*), Great Tit (*Parus major*) and Robin (*Erithacus rubecula*). The majority of these species were present at the Site edges in areas dominated by suitable breeding habitat including treeline, hedgerows and scrub. Probable breeding status was assigned to all green-listed species.

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11.10.8 Other Fauna

11.10.8.1 Amphibians

Common Frog (*Rana temporaria*) was recorded in the 2km (W66J) grid square for the Site in 2014. Smooth Newt (*Lissotriton vulgaris*) was also recorded within this square in 2012 (NBDC: Amphibians and reptiles of Ireland). Hedgerows, dry stone walls and brash stockpiles provide suitable refugia for these species.

11.10.8.2 Reptiles

No Common Lizard (*Zootoca vivipara*) records exist for the relevant 2km grid square (W66J), however, there is potentially suitable habitat for this species located on Site. Common Lizard is associated with a broad range of habitats including scrub and wetland, particularly in Ireland (Herpetological Society of Ireland (HSI, 2025). It is therefore considered possible that common lizard could utilise the habitats on-Site, including areas of stockpiled cleared timber which creates the ideal conditions for hibernation and refuge for common lizard. Stone walls embedded in the current hedgerow and treeline intersecting the Site also contains suitable basking areas for this species, particularly during the Spring and Summer period (Irish Wildlife Trust, 2005).

11.10.8.3 Fish

There are no waterbodies within the Site of the Proposed Development which could support notable fish species such as salmonids or lampreys.

11.10.8.4 Molluscs

There are no waterbodies within the Site which could support notable mollusc species.

11.10.8.5 Invertebrates

No records for rare or protected species of invertebrates are available for the 2km grid square which encompasses the Proposed Development, nor were any recorded during the Site walkovers. There is negligible habitat present on Site to support common butterfly species; however the periphery hedgerows, treelines and woodland may support locally important populations of invertebrates.



Figure 11.33 Hedgerows and Treelines surveyed on 7th of July 2025

11.10.8.6 H1

H1 is a single row shrubby hedgerow, forming a boundary between private agricultural grassland and woodland within the Site. As the structure of H1, the length is approximately 125m, the height ranges 2 to 6m and the width is 2 to 3m. The base structure of H1 is semi-opaque with 2 m high earth bank in the northern part and is 0.5m high earth bank in the southern part. Ground flora on the earth banks are occupied by bramble (*Rubus fruticosus agg*.) and woodland species such as ivy (*Hedera helix*), soft shield-fern (*Polystichum setiferum*), and lords-and-ladies (*Arum maculatum*) (0.5 m high). There were no proper grassy margins along H1, as the eastern side was used for agricultural grassland and the western side was covered by woodland until recently.

Dominant tree species comprising the hedgerow were lime (*Tilla spp*.) in the tree layer (> 5m) and hawthorn in the shrub layer alongside occasional dog rose , wych elm (*Ulmus glabra*), elder and horse-chestnut.

As negative indicators, it was identified that the tree composition included a total of five species of non-native, unfavourable trees listed in the guideline of the HAS (Foulkes et al. 2013): three invasive species, namely, cherry laurel snowberry (Symphoricarpos albus) and sycamore and two other non-native species such as horse chestnut and lime.

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H1 was assessed as 2- Favourable in Hedgerow Condition and 1 - Slightly Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-20).

The following are the overall results of Hedgerow Assessment for H1:

Table 11.20 H1 Overall Assessment Score using the mean of condition/significant scores

Assessment Criteria to Determine Hedgerow Condition	H1
Structural	2- Favourable
Continuity	3- Highly favourable
Negative indicators/Degradation	1- Adequate
HAS Score Overall for Condition (the mean of the above scores)	**2- Favourable**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H1**
Species Diversity Significance	1- Slightly Significant
Ground Flora Significance	2- Moderately Significant
Structure, Construction & Associated Features	1- Slightly Significant
Habitat Connectivity Significance	1- Slightly Significant
HAS Score Overall for Significance (the mean of the above scores)	1- Slightly Significant

11.10.8.7 H2

H2 is a small patch of treeline, forming a boundary between abandoned private property and woodland within the Site. As the structure of H2, the length is approximately 24m, the height ranges 7m and the width is 1.5 to 2m. The base structure of H2 is translucent due to an undeveloped shrub layer. Dominant tree species comprising the hedgerow were grey willow (*Salix cinerea*) in the tree layer (7m). Ground flora was dominated by a mixture of species of overgrown grassland and woodland understory such as bramble, cleavers (*Galium aparine*) and wood avens (*Geum urbanum*). There were no proper grassy margins along H2, as the northern side was covered by woodland until recently and the southern side was an abandoned overgrown grassland.

As negative indicators, a 2m gap was identified in the western section of H2, however, no non-native, unfavourable species were found.

H2 was assessed as 1- Adequate in Hedgerow Condition and 1 - Slightly Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-21).

The following are the overall results of Hedgerow Assessment for H2:

Table 11.21 H2 Overall Assessment Score using the mean of condition/significant scores.

Assessment Criteria to Determine Hedgerow Condition	H2
Structural	1- Adequate
Continuity	1- Adequate
Negative indicators/Degradation	1- Adequate
HAS Score Overall for Condition (the mean of the above scores)	**1- Adequate**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H2**
Species Diversity Significance	1- Slightly Significant
Ground Flora Significance	1- Slightly Significant
Structure, Construction & Associated Features	0- Low Significance
Habitat Connectivity Significance	1- Slightly Significant
HAS Score Overall for Significance (the mean of the above scores)	1- Slightly Significant

11.10.8.8 H3

H3 is a derelict hedgerow, forming a boundary between storage area for containers and woodland within the Site. As the structure of H3, the length is approximately 48m, the height is 2m and the width is 2m. The base structure of H3 is opaque with vegetation on 1.5m high earth bank. It was identified that several tree trunks remained, which are considered evidence of trees felled years ago for land use. H3 was entirely covered by large bindweed (*Calystegia silvatica*) and bramble without dominant tree species. There were no proper grassy margins along H3, as the northern side was covered by woodland until recently and the southern side was used for storage at the base of the hedgerow.

As negative indicators, 0.8m gap was identified, in addition, the margin of the northern side was dominated by noxious weeds such as nettle (Urtica dioica) and cleavers occasionally with non-native species, namely, winter heliotrope.

H3 was assessed as 2- Favourable in Hedgerow Condition and 1 - Slightly Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-22).

The following are the overall results of Hedgerow Assessment for H3:

Table 11.22 H3 Overall Assessment Score using the mean of condition/significant scores.

Assessment Criteria to Determine Hedgerow Condition	H3
Structural	1- Adequate
Continuity	2- Favourable
Negative indicators/Degradation	2- Favourable
HAS Score Overall for Condition (the mean of the above scores)	**2- Favourable**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H3**
Species Diversity Significance	1- Slightly Significant
Ground Flora Significance	0- Low Significance
Structure, Construction & Associated Features	1- Slightly Significant
Habitat Connectivity Significance	1- Slightly Significant
HAS Score Overall for Significance (the mean of the above scores)	**1- Slightly Significant**

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11.10.8.9 H4

H4 is a derelict gappy hedgerow, forming an internal boundary within the Site. As the structure of H4, the length is approximately 114m, the height of hedgerow is 2m (with 7m high trees) and the width is 1.5 to 2m. The base structure of H4 is semi-opaque with vegetation on 1.5m high earth bank. It was identified that several trees along the hedgerow were felled recently. Dominant tree species are hawthorn and elder with bramble, bracken (*Pteridium aquilinum*), soft shield-fern and blackthorn on ground flora. There were no proper grassy margins along H4, as both sides were covered by woodland until recently at the base of the hedgerow.

Four gaps, each between 4 and 6 meters long, were identified as the major negative indicators. Furthermore, the earth bank exhibited signs of drying and erosion, attributed to the removal of woodland trees that previously bordered both sides of the hedgerow. As non-native species, single stand of montbretia (*Crocosmia x crocosmiiflora*) was found on the ground flora.

H4 was assessed as 1- Adequate in Hedgerow Condition and 2- Moderately Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-23).

The following are the overall results of Hedgerow Assessment for H4:

Table 11.23 H4 Overall Assessment Score using the mean of condition/significant scores.

Assessment Criteria to Determine Hedgerow Condition	H4
Structural	1- Adequate
Continuity	0- Unfavourable
Negative indicators/Degradation	2- Favourable
HAS Score Overall for Condition(the mean of the above scores)	**1- Adequate**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H4**
Species Diversity Significance	2- Moderately Significant
Ground Flora Significance	3- Significance
Structure, Construction & Associated Features	1- Slightly Significant
Habitat Connectivity Significance	1- Slightly Significant
HAS Score Overall for Significance (the mean of the above scores)	2- Moderately Significant

11.10.8.10 H5

H5 is a treeline, forming a boundary between the storage area of containers and the former woodland area within the Site. As the structure of H5, the length is approximately 33m, the height of hedgerow is 8.5m and the width is 2.5 to 3m. The base structure of H5 is semi-opaque, consisting of branches from tall trees and juvenile blackthorns with 1.5m (the east side) / 0.4m (the west side) high earth bank. Dominant tree species are pedunculate oak and ash in the three layer, and elder and hawthorn in the shrub layer with some stands of holly (*Ilex aquifolium*) and hazel. There were no proper grassy margins along H5, as the west side was covered by woodland until recently and the east side is used for the storage area at the base of the hedgerow.

As well as H4, the earth bank exhibited signs of drying and erosion, attributed to the removal of woodland trees that previously bordered both sides of the hedgerow as a negative indicator.

H5 was assessed as 2- Favourable in Hedgerow Condition and 2- Moderately Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-24).

The following are the overall results of Hedgerow Assessment for H5:

Table 11.24 H5 Overall Assessment Score using the mean of condition/significant scores.

Assessment Criteria to Determine Hedgerow Condition	H5
Structural	2- Favourable
Continuity	3- Highly Favourable
Negative indicators/Degradation	2- Favourable
HAS Score Overall for Condition (the mean of the above scores)	**2- Favourable**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H5**
Species Diversity Significance	2- Moderately Significant
Ground Flora Significance	3- Significance
Structure, Construction & Associated Features	1- Slightly Significant
Habitat Connectivity Significance	2- Moderately Significant
HAS Score Overall for Significance (the mean of the above scores)	2- Moderately Significant

11.10.8.11 H6

H6 is a shrubby hedgerow without a management, forming a boundary between the former woodland area and an agricultural grassland within the Site. As the structure of H6, the length is approximately 202m, the height of hedgerow is 4.5 to 5m and the width is 2.5 to 3m. The base structure of H6 is semi-opaque mainly with bramble bushes on 1.5m (the north side) / 0.5m (the south side) high earth bank. Dominant tree species are hawthorn, blackthorn and elder in the shrub layer with some tall tree species such as ash. There were no proper grassy margins along H6, as the north side was covered by woodland until recently, and the south side is used for agriculture at the base of the hedgerow.

As a negative indicator, noxious weeds such as common nettle was abundant partially along the hedgerow margin.

H6 was assessed as 3- Highly Favourable in Hedgerow Condition and 1- Slightly Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-25).

The following are the overall results of Hedgerow Assessment for H6:

Table 11.25 H6 Overall Assessment Score using the mean of condition/significant scores

Assessment Criteria to Determine Hedgerow Condition	H6
Structural	3- Highly Favourable
Continuity	3- Highly Favourable
Negative indicators/Degradation	2- Favourable
HAS Score Overall for Condition (the mean of the above scores)	**3- Highly Favourable**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H6**
Species Diversity Significance	1- Slightly Significant
Ground Flora Significance	1- Slightly Significant
Structure, Construction & Associated Features	1- Slightly Significant
Habitat Connectivity Significance	2- Moderately Significant
HAS Score Overall for Significance (the mean of the above scores)	**1- Slightly Significant**

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11.10.8.12 H7

H7 is a straight sided hedgerow, forming a boundary between the Site and a private dwelling. As the structure of H7, the length is approximately 78m, the height of hedgerow is 4m and the width is 2.5 to 3m. H7 has an opaque base structure, where the tree species have been trimmed and managed into atop a 0.6 m high earth bank. Dominant tree species are Leyland cypress (Cupressus x leylandii) and cherry laurel. The south-east side has no grassy margin due to being used as a vehicle road, and the northern-west side wasn't surveyed due to an access limitation within the private dwelling.

As a major negative indicator, it was identified one of dominant species is cherry laurel designated as Invasive species - risk of High Impact by NBDC.

H7 was assessed as 3- Highly Favourable in Hedgerow Condition and 1- Slightly Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-26).

The following are the overall results of Hedgerow Assessment for H7:

Table 11.26 H7 Overall Assessment Score using the mean of condition/significant scores

Assessment Criteria to Determine Hedgerow Condition	H7
Structural	2- Favourable
Continuity	3- Highly Favourable
Negative indicators/Degradation	3- Highly Favourable
HAS Score Overall for Condition (the mean of the above scores)	**3- Highly Favourable**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H7**
Species Diversity Significance	1- Slightly Significant
Ground Flora Significance	1- Slightly Significant
Structure, Construction & Associated Features	1- Slightly Significant
Habitat Connectivity Significance	0- Low Significant
HAS Score Overall for Significance (the mean of the above scores)	**1- Slightly Significant**

11.10.8.13 H8

H8 is a derelict hedgerow that is being developed into a treeline. As the structure of H8, the length is approximately 61m, the height of hedgerow is 5m and the width is 3m. H8 has a semi-opaque base structure. The height of the earth bank and the presence of margins could not be surveyed accurately due to the excavation commencing along the west side. Dominant tree species are grey willows *(Salix cinerea)* in the tree layer, and hawthorn in the shrub layer. Ground flora is dominated by common ivy, bramble and common nettle.

As a major negative indicator, noxious weed such as common nettle is abundant on the understory. Although a 20 m gap was recorded in the section of H8 connecting to H9, the historical satellite imagery in 2024 from Google Earth shows that the original hedgerow did not contain significant gaps at that time. It is therefore considered that the current gap resulted from excavation during construction. As such, the Continuity score has been assessed as 3 – Highly Favourable.

H8 was assessed as 2- Favourable in Hedgerow Condition and 1- Slightly Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-27).

The following are the overall results of Hedgerow Assessment for H8:

Table 11.27 H8 Overall Assessment Score using the mean of condition/significant scores.

Assessment Criteria to Determine Hedgerow Condition	H8
Structural	1- Adequate
Continuity	3- Highly Favourable
Negative indicators/Degradation	3- Highly Favourable
HAS Score Overall for Condition (the mean of the above scores)	**2- Favourable**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H8**
Species Diversity Significance	2- Moderately Significant
Ground Flora Significance	1- Slightly Significant
Structure, Construction & Associated Features	1- Slightly Significant
Habitat Connectivity Significance	0- Low Significant
HAS Score Overall for Significance (the mean of the above scores)	**1- Slightly Significant**

11.10.8.14 H9

H9 is a hedgerow with overgrown base structure. As the structure of H9, the length is approximately 138m in total, with 71 m located within the Site, the height of hedgerow is 3.5m and the width is 2.5m. H9 has an opaque base structure with developed vegetation on 0.6 high earth bank. Dominant tree species are hawthorn and blackthorn with some stands of dog roses and elder in the shrub layer. Ground flora is dominated by common ivy, creeping thistle (Cirsium arvense) and common nettle.

As a major negative indicator, noxious weeds such as creeping thistle and common nettle are abundant on the understory.

H9 was assessed as 2- Favourable in Hedgerow Condition and 1- Slightly Significant in Hedgerow Significance (Ecology) based on the HAS (Table 11-28).

The following are the overall results of Hedgerow Assessment for H9:

Table 11.28 H9 Overall Assessment Score using the mean of condition/significant scores

Assessment Criteria to Determine Hedgerow Condition	H9
Structural	2- Favourable
Continuity	3- Highly Favourable
Negative indicators/Degradation	2- Favourable
HAS Score Overall for Condition(the mean of the above scores)	**2- Favourable**
Assessment Criteria to Determine Hedgerow Significance in Ecology	**H9**
Species Diversity Significance	2- Moderately Significant
Ground Flora Significance	0- Low Significant
Structure, Construction & Associated Features	1- Slightly Significant
Habitat Connectivity Significance	0- Low Significant
HAS Score Overall for Significance (the mean of the above scores)	**1- Slightly Significant**

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Table 11.29 Collated Hedgerow Scores

Hedgerow	Condition Score				Significance in Ecology Score				
	Structural	Continuity	Negative Indicator	Overall	Species Diversity	Ground Flora	Structure	Connectivity	Overall
H1	2	3	1	**Favourable**	1	2	1	1	**Slightly Significant**
H2	1	1	1	**Adequate**	1	1	0	1	**Slightly Significant**
H3	1	2	2	**Favourable**	1	0	1	2	**Slightly Significant**
H4	1	0	2	**Adequate**	2	3	1	1	**Moderately Significant**
H5	2	3	2	**Favourable**	2	3	1	2	**Moderately Significant**
H6	3	3	2	**Highly Favourable**	1	1	1	2	**Slightly Significant**
H7	2	3	3	**Highly Favourable**	1	1	1	0	**Slightly Significant**
H8	1	3	3	**Favourable**	2	1	1	0	**Slightly Significant**
H9	2	3	2	**Favourable**	2	0	1	0	**Slightly Significant**

Overall, while condition scores of the nine hedgerows/treelines range Highly Favourable to Adequate, significance in ecology scores of them show Slightly Significant at the average.

While most of hedgerows/treelines within the Site have derelict profile with poor condition base structure, the conditions were scored relatively well as regards to adequate height and width, continuity, earth banks over 0.5m and small coverage of common ivy in the canopies. On the other hand, the significance was scored as being mostly slight reflecting the poor diversity of woodland species, the lack of connectivity with multiple semi-natural habitats and absence of drainage/drain.



Figure 11.34 Hedgerow areas to be removed under landscape plans (SRLA, 2025)

11.10.9 Evaluation of Ecological Features

The value of the ecological features, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation at different geographical scales (NRA, 2009), presented in Appendix 11.2. This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. Based on best practice (CIEEM, 2018), any features considered to be less than of local value are not assessed within this EcIA.

The impacts of the Proposed Development on the identified KERs are assessed in Section 11-11. Table 11-30 below summarises the evaluation rating assigned to each ecological feature and the rationale behind these evaluations is also provided.

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Table 11.30 Evaluation of Designated Sites, Habitats, Flora and Fauna recorded within the Site and surrounding area. Those identified as Key Ecological Receptors (KERs) are highlighted in green.

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
DESIGNATED SITES			
Cork Harbour SPA (004030) Linear Distance to Proposed Development – 6.3km east	International Importance	Screened out for likely significant effects in AA screening due to lack of hydrological links and absence of Ex-Situ habitats.	No
Lee Valley pNHA (000094) Linear Distance to Proposed Development – 4.5km north	National Importance	Linear distance from Proposed Development and lack of hydrological links.	No
Cork Lough pNHA (001081) Linear Distance to Proposed Development – 3km northeast	National Importance		No
Douglas River Estuary pNHA (001046) Linear Distance to Proposed Development -6.3km east.	National Importance		No
HABITATS			
Young Woodland (WN)	Local Importance (Higher Value)	In its original state, this area was of high biodiversity value to numerous species including birds, bats, non-volant small mammals, plants and insects.	Yes
Hedgerows (WL1)	Local Importance (Higher Value)	Overall, while condition scores of the nine hedgerows/treelines range Highly Favourable to Adequate, significance in ecology scores of them show Slightly Significant at the average.	Yes
Treeline (WL2)	Local Importance (Higher Value)	Treelines are present along the fringes of the Site. The Site is bordered on the eastern edge by mature Treeline (WL2) which lies marginally off Site and is dominated by mature broadleaf trees, capable of supporting a broad range of species.	Yes
Scrub (WS1)	Local Importance (Lower Value)	An area of scrub remains at the centre of the Site containing bramble, fern species and non-native invasive sycamore. Also present is Horse Chestnut and Birch saplings. Scrub areas are limited to this isolated patch and is deemed less significant, even at a local scale.	No
Buildings and Artificial Surfaces (BL3)	Negligible Importance)	Roadways and hard standing areas are present on the northern and western Site edges and are in current use for haulage and car parking purposes. These are of negligible value ecologically.	No
Spoil and bare ground (ED2)	Local Importance (Lower Value)	Spoil and bare ground dominate the majority of the Site footprint showing early re colonizing plant species and natural re-vegetation.	No
Young Woodland (WN Brash Stockpiles)	Local Importance (Higher Value)	Stockpiles of cleared wood remain on Site. These areas contain suitable habitat for nesting bird species and hibernating species such as common lizard and common frog.	Yes
Dry Stone Wall (BL3)	Local Importance (Higher Value)	A dry-stone wall is contained within the hedgerow intersecting the Site in a north/south direction.	Yes
ADJACENT AND LINKED HABITATS			
Hedgerows (WL1)	Local Importance (Higher Value)	Hedgerows of comparable quality to those located on-Site are present on parcels of land extending directly south, east and west of the Development boundary. These areas are not deemed to be sensitive to the Proposed Development activities.	No
FLORA			
Invasive Species	Negligible value	Limited stands that provide little ecological value including Sycamore which is re-establishing throughout much of the spoil and bare ground areas of the Site. Cherry laurel (High-impact is also present).	No

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Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
FAUNA			
Bats	Local Importance (Higher Value)	Moderate suitability habitat for foraging and commuting within the Site and the wider landscape. Negligible roosting potential on Site.	Yes
Breeding Bird Assemblages	Local Importance (Higher Value)	The Site was found to hold 24 bird species, the majority of which were confined to the Site edges. Seven target species were recorded with none confirmed as breeding within the confines of the Site. Green-listed raptors (Sparrowhawk and Buzzard) were classified as confirmed and probable breeding species respectively, off Site.	Yes
Hedgehog (*Erinaceus europaeus*) Pygmy Shrew (*Sorex minutus*)	Local Importance (Higher Value)	Suitable habitats present for these small native mammals on-Site within woodland, hedgerows and scrub. The majority of woodland habitat has already been removed as previously discussed.	Yes
Amphibians - Common Frog (*Rana temporaria*)	Local Importance (Higher Value)	Suitable hibernating habitats in areas of brash stockpiles and in hedgerow areas.	Yes
Reptiles	Local Importance (Higher Value)	Suitable refuge and basking areas within dry stone walls, wood stockpiles and scrub, which are proposed for removal.	Yes
Fish	Negligible Value	No suitable habitat on-Site or in areas adjacent.	No
Molluscs	Negligible Value	No suitable habitat on-Site or in areas adjacent.	No
Invertebrates	Local Importance (Lower Value)	No records recorded during the Site walkovers. There is negligible habitat present on Site to support common invertebrate species; however, the periphery hedgerows, treelines and woodland may support locally important populations.	No

11.11 Ecological Impact Assessment

11.11.1 Avoidance and Mitigation Embedded in the Project Design

The Proposed Development includes several embedded design features that may act to avoid or mitigate negative impacts that would likely occur in the absence of these features. However, as opposed to typical mitigation measures, the implementation of these features is integral to the design and completion of the Proposed Development, and as such the impact assessments are performed with consideration of these features as integrated parts of the Proposed Development. All considered embedded design features that may act to mitigate negative impacts on local ecology and environment are listed in Table 11-31.

Table 11.31 Embedded Design Features and their potential to act to avoid or mitigate negative impacts on the local ecology and environment.

Embedded Design Feature	Avoidance / Mitigation Potential
Surface Water Management (SuDS Measures) • Green Roofs • Swales • Bioretention / Tree Pits • Permeable Paving • Attenuation Systems	The SUDS features included in the Project Design will ensure the surface water discharge from the Proposed Development is reduced to greenfield runoff rates. These features will be implemented as part of the surface water drainage design.
Landscape Design: • Inclusion of lawns and meadow grassland. • Minimal vegetation removal incorporating existing woodland areas. • Native tree and shrub planting	Accounting for the listed design features, the retention of the mature hedgerows and woodland on Site, the Proposed Landscape Plan is expected to have an overall positive impact on a local scale.
Construction Site Best Practice: • Compound facilities and parking • Traffic management • Material storage zone • Road cleaning • Resource and waste management plan • Sediment and water pollution control measures • Biodiversity protection measures • Dust control measures and best practice • Noise and vibration control best practice Operational Phase Mitigating Features: • Appropriate foul water treatment Off-Site at a plant with adequate capacity at WWTP. • Operational Phase Lighting in line with best practice for nocturnal wildlife	A range of measures are outlined in the CEMP which mitigation and minimise the likelihood of any pollution or negative effects on the environment resulting from the construction phase.

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The below Sections assess the potential impacts on the previously identified KERs of the Site and immediate surrounds during the Construction and Operational Phases of the Proposed Development. The KERs identified are described in Section 11.9.9 above.

11.11.2 Construction Phase

11.11.2.1 Impacts on Habitats and Flora

The habitats on Site and in the adjacent environs considered as KERs (NRA, 2009) will remain intact during the construction phase of the development with little or no removal of the boundary habitats and peripheral hedgerows, woodland, treeline and scrub areas. The habitats with the potential to be affected during construction are listed and discussed below.

11.11.2.1.1 Young Woodland (WN)

The previously present young woodland area which dominated the Site footprint and had been in formation since the mid-2000s is largely removed, apart from a very small pocket on the southeast corner of the Site which is also to be removed as part of the Proposed Development.

It is anticipated that minimal further tree removal will be required for the remaining hedgerows and surrounding treelines, minimising the habitat loss and disturbance to this ecologically valuable habitat. Effects on the young woodland habitat during the construction phase are assessed as **negative, significant** and **permanent**.

11.11.2.1.2 Hedgerows (WS1)

Most hedgerows are to be retained, and a continuous wildlife corridor will be facilitated throughout the lifetime of the Proposed Development. During the construction phase small areas of hedgerow to the northwest of the Site and to the southeast corner will be permanently removed to facilitate the possibility of future development and connectivity with adjoining areas.

The southernmost hedgerow adjoining agricultural lands to the south will be trimmed and wire fenced at the northern side to separate the hedge from private garden areas. Heavy machinery will be used within the root protection zone (<1m from the hedgerow canopy) in areas of removal only. An arboricultural assessment prepared by Geotree (2025) has outlined above and below ground mitigations relating to the treatment of retained trees on Site during the construction phase.

The effects arising on hedgerows during the construction phase is assessed as **negative, moderate** and **short-term.**

11.11.2.1.3 Treeline (WL2)

Treeline is present slightly off Site as a boundary feature at the eastern edge of the Proposed Development boundary

''*Dominant tree species comprising the hedgerow were lime (Tilla spp.) in the tree layer (> 5m) and hawthorn Crataegus monogyna in the shrub layer alongside occasional dog rose (Rosa canina agg.), wych elm (Ulmus glabra), elder (Sambucus nigra) and horse-chestnut (Aesculus hippocastanum)*'' (DNV, 2025).

Trimming of the eastern treeline is also proposed during the construction phase and overall affects are assessed as **negative, slight and short-term**.

11.11.2.1.4 Young Woodland (WD Brash Stockpiles)

The effects arising during the construction phase associated with the clearance of these stockpiles are assessed as **negative**, **significant** and **short term.**

11.11.2.1.5 Dry Stone Wall (BL1)

Dry stone walls remain within the north-south hedgerow which is planned for removal in parts as part of the Proposed Development. As the hedgerow and walls within it are to remain largely in-situ, the effects during the construction phase are relating primarily to the potential disturbance and displacement of resting/hibernating species and are assessed as **negative, slight and short-term**.

11.11.2.2 Impact on Bat Assemblages

As outlined in the CEMP (OSL, 2025a) accompanying this application, construction works will typically be confined to daylight hours and night-time lighting will therefore not be required during the Construction Phase of the Proposed Development. However, where portable lighting is required, there is potential for impacts to local bats due to potential increased lighting associated with the Construction Phase of the Proposed Development, particularly if inadvertently directed to the linear vegetation bounding the Site. Therefore, increased levels of lighting during the Construction Phase may deter bats from commuting and foraging within the vicinity of the Site and impacts are assessed as **negative, slight and short-term.**

Construction activity is to be expected in the vicinity of the treelines. Lighting during works is in line with the Institute of Lighting Professionals (ILP) (2023) guidance on bat sensitive lighting during construction activities.

There was a necessity to remove the young woodland previously present throughout the Site, and further removal of hedgerows to the west and south, and fragmentation of the central hedgerow during the construction phase is planned. The loss of woodland, sections of hedgerow and linear features during the construction phase is assessed as having a **negative, significant** and **permanent effect** on local assemblages of commuting and foraging bats.

11.11.2.3 Impact on Breeding Bird Assemblages

The Site was found to hold 24 bird species, the majority of which were confined to the Site edges. Seven target species were recorded with none confirmed as breeding within the confines of the Site. Green-listed raptors (Sparrowhawk and Buzzard) were classified as confirmed and probable breeding species respectively, but their usage of the Site footprint is restricted to resting and foraging. The clearance of young woodland previously present throughout the Site, further removal of hedgerows to the west and south, and fragmentation of the central hedgerow during the construction phase are assessed as having **negative**, **significant** and **long-term** effects on breeding birds.

Should vegetation be cleared as part of the Construction Phase during the breeding bird season (March 1st to August 31st); there is the potential for direct mortality to bird species, the loss of bird habitat, disturbance and displacement effects, and the destruction of nests. This would be in contravention of the Wildlife Act 1976 (as amended) which provides protection to breeding bird species and their nests and young. Therefore, in the absence of any mitigation or precaution, this risk represents a potential **negative, significant** and **short-term** impact on breeding birds at a local scale

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11.11.2.4 Impact on Non-volant Mammals (excl. bats)

11.11.2.4.1 Small mammals.

Hedgehog and Pygmy Shrew are species likely to be associated with hedgerows and scrub which is present on-Site. No Hedgehogs were observed on-Site during any of the Site visits in 2025, but they are likely to be present within the scrub, hedgerow and brash stockpile areas and have been historically recorded in the relevant 2km grid square encompassing the Site. The effect on Hedgehog and other small mammals such as Irish Stoat and Pygmy Shrew during the construction phase of the development is assessed as **negative, slight** and **short-term** due to potential for entrapment, injury or death resulting from vegetation clearance and other construction activities.

11.11.2.5 Impact on Amphibians

Suitable refugia habitats for amphibians are present within the hedgerows and brash stockpiles on Site. In the absence of mitigation, construction phase impacts (such as death and entrapment) on locally occurring populations of amphibians are assessed as **negative, significant** and **short-term**.

11.11.2.6 Impact on Reptiles (common lizard)

Common lizard may use the dry-stone walls for basking and brash stockpiles as refuge. Effects on reptiles during the construction phase due to death or entrapment are assessed as **negative**, **moderate** and **short-term.**

11.11.3 Operational Phase

11.11.3.1 Impacts on Habitats and Flora

11.11.3.1.1 Young Woodland

The landscape plan (SRLA, 2025) provides for the creation of a woodland trail, buffer planting and a central hedgerow spine running through the development area in a north south direction. This design will serve to keep the Site area connected to the broader landscape, facilitating connectivity of a range of species to and from the developable area.

Ecological connectivity within the Site and to the broader landscape is a key element of the landscape design and lighting is designed to be nocturnal wildlife friendly. Effects on the young woodland habitat during the operational phase are assessed as **imperceptible.**

11.11.3.1.2 Hedgerows

Most hedgerows are to be retained, and a continuous wildlife corridor will be facilitated throughout the lifetime of the Proposed Development. During the construction phase hedgerows of poor to moderate quality will be pruned and interplanted to improve the long-term quality for biodiversity.

The southern hedgerow will be adjacent to private garden areas during the operational phase. While the hedgerow will be retained, the planned design will limit the accessibility for long term management. There remains the possibility to manage the hedgerow optimally from the southern lands, depending on landowner cooperation.

The proposed landscape plan incorporates extensive native hedgerow interplanting and inclusion of native hedgerow species, as well as the interplanting of hawthorn on poorly graded areas on the overgrown unmaintained southern hedgerow. Hedgerows planned for removal have been scored in the hedgerow appraisal survey and having regard to the condition of the hedgerows in relation to ecological significance impacts are anticipated to be **positive**, **slight** and **long-term.**

11.11.3.1.3 Treeline

Treeline is present slightly off Site at the eastern edge of the Proposed Development boundary. The treeline has been shown to be an important foraging and commuting habitat for bats locally.

This likelihood is increased by the volume of people likely to be present in the immediate area of the treeline and natural features surrounding the Site. Designated walkways, planting of pollinator friendly species and appropriate management incorporated into the landscape plan will negate these effects by providing clear pathways, minimising encroachment into natural areas and having appropriate lighting in line with the most recent guidance. The effect on treelines during the Operational Phase is assessed as **negative, slight** and **long-term.**

11.11.3.1.4 Young Woodland (Brash Stockpiles)

The stockpiles will no longer be present post construction and effects arising during the operational phase associated with the clearance of these stockpiles are assessed as **imperceptible**.

11.11.3.1.5 Dry Stone Wall (BL1)

The dry stone wall will remain in place during the operational phase and impacts are assessed as **imperceptible** due to the proposed landscape plan.

11.11.3.2 Impact on Bat Assemblages

During the Operational Phase, there is potential for disturbance to bats utilising the immediate surrounds of the Site through light pollution. Recreational space will be provided via greenways and open spaces which will be designed to be wildlife friendly, particularly in terms of lighting (lux) levels which will ensure lighting in areas sensitive to foraging bats and other nocturnal wildlife will be kept at suitable levels (<1 lux)., Taking into account the loss of young woodland habitat, the net impact on local bats is assessed as **negative**, **moderate and permanent**.

It is noted that the building heights do not pose a collision risk for bats. Irish bat species navigate largely by echolocation, and fixed structures, such as those proposed as part of the Proposed Development, present a negligible risk in terms of collision.

11.11.3.3 Impact on Breeding Bird Assemblages

11.11.3.3.1 Collision Risk

In relation to collision risk, as outlined by Martin (2011) birds are vulnerable to collision with objects that seem obvious or conspicuous to humans, such as buildings, and it is unclear as to why this occurs, even under conditions of apparent clear visibility. It is suggested that bird collisions may be the result of factors such as the use of binocular and lateral vision, making commuting birds periodically blind in the direction of travel. Birds are at highest risk from objects such as buildings when they protrude unnaturally above the surrounding natural vegetation.

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The Proposed Development includes the construction of relatively low level residential buildings with maximum heights of 4-5 storeys and as such, the risk of migrating birds colliding with the structure due to its height is deemed to be negligible (Migrating species tend to commute far above this with Swans and Geese flying up to 2500ft (ca.750m) during migration along Irish Coasts (Irish Aviation Authority, 2020). Some of the most at-risk groups (classified as 'medium' and 'high' collision risk species) include wader species; waterfowl such as geese, swan and duck species; and some raptor species. (Eirgrid, 2012).

Therefore based on the heights of the proposed structures, their physical appearance and the nature of their location and the lack of commuting birds observed during all Site visits, it is accepted that birds including any 'at-risk' species, do not have the potential to be impacted by the Proposed Development in terms of collisions and the risk is therefore deemed to be **imperceptible** in the absence of any mitigation.

11.11.3.3.2 Habitat loss and Ex-Situ Usage by SCI Bird Species

The Site itself is not deemed to represent suitable ex-situ feeding/roosting habitat for the species designated as SCI's of Cork Harbour SPA, and no such species have been recorded on or near the Site during surveys. The Site is also sufficiently far removed from this important bird area (>6km) to not have any significant effects on bird assemblages associating with the SPA.

The operational phase of the Proposed Development will have increased footfall, lighting and open spaces, with habitats suitable for common breeding birds included in the landscape design. Impacts on breeding birds during the operational phase will be **neutral**, **slight** and **permanent**.

11.11.3.4 Impact on Non-volant Mammals (excl. bats)

11.11.3.4.1 Small mammals.

Hedgehog and Pygmy Shrew are species likely to be associated with hedgerows and scrub which is present on-Site. Due to the connectivity within Site and to the broader landscape as part of the proposed landscape design, the effect on hedgehog and other small mammals such as Irish Stoat during the operational phase of the development is assessed as **positive**, **slight** and **permanent.**

11.11.3.5 Impact on Amphibians

Operational phase impacts after a period of establishment of the newly landscaped areas is expected to be **positive**, **slight and permanent** due to the landscape plan**.**

11.11.3.6 Impact on reptiles (common lizard)

Operational phase impacts after a period of establishment of the newly landscaped areas is expected to be **positive**, **slight and permanent.**

11.11.4 Do Nothing Impact

In the absence of the Proposed Development, the Site at Ardarostig, Bishopstown would likely have remained in its pre-clearance state as young establishing woodland, which was establishing as a result of agricultural land abandonment. Without the cessation of agriculture and the zoning of the land as 'Sustainable Residential Neighbourhoods' under the Cork City Development Plan 2022-2028, the land is likely to have remained in agricultural use long term, prior to the establishment of young woodland. It is worth highlighting that the presence of high-impact cherry laurel suggests that this plant would have continued to spread in the absence of the Proposed Development.

11.11.5 Cumulative Effects

11.11.5.1 Summary

Cumulative Impacts can be defined as 'impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project'. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and Proposed Developments was completed as part of this assessment. The following projects and plans were reviewed and considered for possible cumulative effects with the Proposed Development.

11.11.5.2 Relevant Plans and Policies

The following plans and policies were reviewed and considered for potential in-combination effects with the Proposed Development.

- Cork City Development Plan (2022-2028).
- Cork Biodiversity Action Plan (2021-2026).
- All Ireland Pollinator Plan (2021-2025).

Each of these plans has undergone AA, and where potential for likely significant effects has been identified (e.g., in the case of the Cork City Development Plan), an NIS has been prepared which identifies appropriate mitigation. As such, it is considered that the plans and policies listed will not result in in-combination effects with the Proposed Development.

The Cork City Development Plan 2022-2028 has directly addressed the protection of biodiversity through specific Objectives and policies The Cork Biodiversity Action (2021-2026) and the All-Ireland Pollinator plan are set out to protect and improve biodiversity and as such will not result in negative in-combination effects with the Proposed Development.

Therefore, on examination of the above it is considered that there are no means for the Proposed Development to act in-combination with any plans or projects that would cause any likely significant effects to ecological sensitivities.

11.11.5.3 Existing Planning Permissions

As part of this assessment, other offsite developments and proposed offsite developments as detailed in Chapter 1 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Ardarostig LRD Development.

It is considered that there is no potential for the Proposed Development to act in-combination with other permitted developments in the vicinity that could cause likely significant effects on any nearby KERs.

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11.11.5.4 Carrigrennan Wastewater Treatment Plant (WWTP)

Foul waters generated by the Proposed Development will be pumped from the recently installed WWPS and subsequently processed at Carrigrennan WWTP. Likely significant effects on Lough Mahon (and associated SPA) as a result of foul waters generated by the Proposed Development were screened out at stage one of the AA process, as detailed below.

The Carrigrennan WWTP was identified by the EPA as being non-compliant with the Emission Limit Values (ELVs) as set out in the Wastewater Discharge Licence for 2022, according to the 2022 Annual Environmental Report (AER) for the facility (Irish Water, 2022). It is also noted that Biochemical Oxygen Demand (BOD) and Total Nitrogen were the only parameters of all ELV's that this treatment plant was non-compliant for.

Ambient monitoring of the Lough Mahon coastal/transitional waterbody does not meet the required Environmental Quality Standards (EQS) at the upstream and downstream monitoring locations. The discharge from the WWTP does not have an observable impact on water quality or an observable im-pact on the Water Framework Directive Status

It is not expected that foul waters generated by the Proposed Development will present any source of significant impacts to Lough Mahon transitional waterbody and associated SPA post treatment and discharge from the WWTP.

11.12 Avoidance, Mitigation, Compensation and Enhancement Measures

The following mitigation measures will be implemented as part of the Proposed Development and in line with the policy objectives of the Cork Biodiversity Action Plan (2021-2026), in order to minimise the potential impacts on the existing ecology as discussed in previous Sections.

11.12.1 Incorporated Design Mitigation

Green infrastructure is incorporated into the design of the Proposed Development. The inclusion of native species will enhance biodiversity overall with provision of native shrubs, trees and sustainable surface water drainage methods as outlined in the landscape strategy prepared by SRLA (2025).

11.12.2 Construction Phase Mitigation

11.12.2.1 Biodiversity Measures within the CEMP

The CEMP (OSL, 2025b) has a number of biodiversity specific measures relating to the construction phase. The document states the following to protection to biodiversity.

"*All site clearance and landscaping works will comply with current legislative requirements and best practice. All retained trees that are within or close to the working wayleave of the proposed development will be protected in accordance with the requirements of British Standard BS5837:2012 Trees in Relation to Design and Construction' –Recommendations, with protective fencing being installed around all trees to be retained, prior to commencement of development. The planting plans and landscaping proposals will ensure that no invasive species are introduced, either deliberately or inadvertently, to the site from imported materials or other activities. Any licence necessary will be obtained if there could be a significant disturbance of any protected species*."

In consultation with the Project Ecologist, construction phase mitigation is also detailed in the CEMP for the following elements:

- Appropriate Lighting for bats and other nocturnal wildlife
- Timing of works and vegetation clearance

11.12.2.2 Mitigation 1: Surface Water Protection

During the Construction Phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (OSL, 2025b). These measures will address the main activities of potential impact which include:

- Control and Management of surface water runoff.
- Control and management of shallow groundwater during excavation and dewatering.
- Management and control of soil and materials.
- Appropriate fuel and chemical handling, transport and storage.
- Management of accidental release of contaminants at the site.
- Control and handling of cementitious materials.

The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Good construction management practices will minimise the risk of pollution from construction activities at the subject site including but not limited to:

- Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- CIRIA, 2015. Environmental Good Practice on Site (C741).
- Enterprise Ireland Oil Storage Guidelines (BPGCS005).
- Environmental Protection Agency (EPA), 2013. IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities.
- CIRIA, 2007. The SuDS Manual (C697).
- UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG).
- CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648).
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.

11.12.2.3 Mitigation 2: Timing of works and vegetation clearance

Works likely to cause disturbance to nesting birds and resting or hibernating herpetofauna should be timed to take place outside the breeding bird season and in line with best practice i.e. during the period September – February inclusive for birds, See Table 11-32 regarding optimal timings for vegetation clearance for a range of species groups. As shown in Table 11-32, the optimal period for vegetation clearance in an overall context is during September and October.

Any clearance of scrub on-Site should take place during the period (February to March inclusive) in line with the strict timing of vegetation clearance stated in the Wildlife Act 1976 and subsequent amendments. All treelines and hedgerows currently in place should be retained and reinforced with native species where practicably possible as part of the Proposed Development.

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Table 11.32 Optimal timing of vegetation clearance.

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
Amphibians	Vegetation /habitat clearance permissible		Amphibian breeding season **(Estimated)** No habitat destruction unless confirmed to be devoid of tadpoles and other signs of amphibians				Vegetation/habitat clearance is permissible if devoid of tadpoles and signs of amphibians.					
Breeding Birds	Vegetation clearance permissible		Nesting bird season No clearance of vegetation or works permitted unless confirmed to be devoid of nesting birds by an ecologist.						Vegetation clearance permissible.			
Hibernating mammals (namely Hedgehog)	Mammal hibernation season No clearance of vegetation is permitted unless confirmed to be devoid of hibernating mammals by an ecologist.					Vegetation clearance permissible.					Mammal hibernation season No clearance of vegetation or works to relevant structures is permitted unless confirmed to be devoid of hibernating mammals by an ecologist.	
Common Lizard	Lizard Hibernation Season No habitat clearance permissible			Active period Habitat (Scrub) clearance permissible.							Lizard Hibernation Season No habitat clearance permissible	

11.12.2.4 Mitigation 3: Construction Phase Lighting

Overnight lighting will be minimised as much as possible with any essential overnight lighting directed away from natural habitats along the boundaries of the Site (i.e., the woodland, hedgerows and scrub areas interspersing the Site). Where overnight lighting cannot be avoided in these areas due to health and safety concerns, the lighting within the Proposed Development will be designed and installed to minimise the impact on local wildlife and in accordance with the Bat Conservation Trust guidelines on artificial lighting and bats (BCT 2023):

- There will be no light spill to the boundary habitats.
- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

11.12.2.5 Mitigation 4: Waste Management

As best-practice, all construction-related rubbish on-site e.g., plastic sheeting, netting etc. should be kept in a designated area on-site and kept off ground level so as to protect small fauna (such as small mammals) from entrapment and death.

11.12.2.6 Mitigation 5: Pre-construction Amphibian, Reptile and Mammal Surveys

Pre-construction surveys will be carried out no more than 3 months prior to Site clearance to assess the likely presence of breeding birds, amphibians, common lizard or small mammals, with particular attention paid to all brash stockpiles and removable hedgerows on Site.

11.12.2.7 Mitigation 6: Reduction of Noise Related Impacts

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction/Infill Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

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To mitigate this disturbance, the following measures will be implemented:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by Site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well-maintained and avoid steep gradients.
- Minimize drop heights for materials or ensure resilient material underlies.
- Where noise originates from resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which Site activities likely to create high levels of noise are permitted.
- Appointing a Site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the proposed development will be reduced to a minimum.

11.12.2.8 Mitigation 7: Invasive Species Management

Cherry laurel which is classed as a High-impact invasive species is present within the confines of the Site. A suitably qualified ISM specialist will be required to make provision for the control and adequate removal and monitoring of this species in order to protect the integrity of the protected area on Site, and the wider environs.

All of the medium impact invasives and their respective distributions at the Site are not significant and their removal will not be an issue, however this will be placed at the discretion of the invasive species specialist with responsibility for invasive species management throughput the duration of the project.

Transport Infrastructure Ireland (2020) guidance 'The Management of Invasive Alien Plant Species on National Roads – Technical Guidance' will be consulted with regards the treatment, removal and disposal of invasive flora at the Site.

11.12.2.8.1 Biosecurity Measures

The following measures will be adhered to, to avoid the introduction or dissemination of invasive species to and from the Site of the Proposed Development site.

For the Construction Phase the contractor will prepare a project specific IAPS standard operating procedure document, in advance of work commencement. The document should be prepared by an IAPS specialist and should cover the bio-security measures to be taken, including the maintenance of records, to screen for the introduction of IAPS onsite, and to enable their tracing if such an introduction occurs; and to ensure no transmission of IAPS offsite. These measures to include:

- Removal of Cherry Laurel from the Site to be advised by a Invasive Species specialist.
- Validation that all machinery / vehicles are free of IAPS, prior to their first introduction to site.
- Certification from the suppliers that all imported soils and other fill/landscaping materials are free of IAPS.
- A regular schedule of site inspections across the IAPS growing seasons, for the duration of the construction works programme.
- Validation that all machinery / vehicles are free of IAPS, prior to leaving the site.
- Appropriate and effective site biosecurity hygiene to ensure that no IAPS are transmitted off-site for the duration of the Proposed Works.

11.12.3 Operational Phase Mitigation

11.12.3.1 Mitigation 8: Surface Water Protection

Regular maintenance of surface water treatment facilities in accordance with best practice and manufacturers guidelines is required to keep the drainage system in adequate working order and to allow continued filtration of the surface water.

11.12.3.2 Mitigation 9: Landscape Management

Pollinators and foraging bats will be promoted through the management of the soft landscaping on-Site during the lifetime of the development, see landscape strategy prepared by SRLA (2025).

11.12.4 Biodiversity Enhancement Measures

11.12.4.1 Enhancement 1: Swift Bricks

Swift was recorded in flight over the Site during breeding bird surveys with no suitable breeding areas visible in the immediate vicinity of the Site. It is proposed to include swift bricks or external swift boxes on the western facades of the buildings as an enhancement measure. A minimum of 15 bricks/ boxes will be incorporated across the Development and will be installed a minimum of 5m off the ground. Care will be taken to ensure no obstacles or plate glass windows are located below the bricks/ boxes.

Guidelines for the bird box scheme should follow guidelines published by Swift Conservation Ireland, and those published by Birdwatch Ireland entitled "Saving Swifts" (2019). The incorporation of swift bricks/boxes will help recover the declining swift population in the local area, which are now Red Listed in Ireland (Gilbert et al., 2021).

Swifts are a "clean" bird species which remove their own wastes from their nests periodically. As such, swift bricks/boxes do not require any cleaning by the management company.

A project ecologist will be instructed to oversee the installation of the swift bricks or boxes, and calling system, during the construction phase or after the development has been completed, depending on which option is decided upon by the design team.

11.12.4.2 Enhancement 2: Bat Boxes

Common bat species were observed foraging on the site during the bat surveys.. The boxes will provide roosting opportunities for local bat populations and help to increase the availability of suitable roost features in the area. A total of 3-5 bat boxes are recommended to be installed within the central hedgerow spine in areas of low light and human disturbance.

These boxes will be erected under supervision of the project ecologist and monitored for bat activity in the years post construction.

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11.12.4.3 Enhancement 3: Amphibian and Reptile Hibernacula

It is recommended to enhance the natural areas of the Site for amphibian and reptile use by providing suitable refuge and hibernacula

Hibernacula for amphibians and reptiles is relatively easy to create from rubble, wood and soil, all of which can likely be sourced from the Site during works. Rubble and wood in various sizes should be piled either in a shallow depression or on the slope of the attenuation pond in a disorganised way to create nooks and crevices. Larger tree trunks or rocks should be placed so that they will protrude through the final mound to provide open entrances to the mound. This pile should then be covered in soil to allow the inner crevices to maintain a stable temperature through the winter and allow for hibernation. The top can be planted with for example grass and native wildflowers. See Figure 11-35 for examples of finished hibernacula.



Figure 11.35 Examples of suitable amphibian and reptile hibernacula and refugia.

11.12.4.4 Enhancement 4: Bee Hotels

Nesting boxes designed for solitary bees will be installed within suitable areas of the Site, near areas of flowering meadows or within the central hedgerow spine.

Large bee or insect hotels will not be installed. Guidance from the All -Ireland Pollinator Plan states "*Don't install a large bee or insect hotel. Large bee hotels are attractive to humans, but not great for pollinators. They can encourage the spread of disease and attract predators. Avoid anything bigger than an average-sized bird box. There are many other ways to provide nesting habitats for pollinators, such as providing wild areas of undisturbed long grass, and scraping back some bare earth. If you want to make a bee hotel, make sure it is small, and position it away from bird feeders so the insects aren't easy targets." A link to a "How-to-guide Creating wild pollinator nesting habitat*" is provided for the development management company to put these habitats in place: *How-to-guide-Nesting-2018-WEB.pdf (pollinators.ie)*. An appointed ecologist will oversee the creation of these habitats.

11.12.4.5 Enhancement 5: Wildflower Meadows

The Landscape Plan includes the planting of wildflower meadows. It is recommended that wherever possible proposed wildflower areas are allowed to regenerate naturally by way of the existing seedbank within the soils present on Site. In addition, this can be supplemented by locally sourced wildflower seeds where necessary. At the very least, it is recommended that all wild-flower seeds will be Irish Provenance Certified Seed, from a reputable source such as Design by Nature (Wildflowers.ie). To maximise the biodiversity value of the landscaping at the Site, consideration has been made to the All-Ireland Pollinator Plan planting code (NBDC, 2022).

11.13 Monitoring

Table 11-33 below provides a summary of the required monitoring and pre-works inspections during the Construction Phase, as well as any surveys that should be completed during the Operational Phase. The monitoring, inspections and surveys will ensure that the identified mitigation measures are implemented and maintained efficiently and have the desired effect of protecting the local ecology from adverse impacts.

The monitoring/surveys outlined below will be included in a Biodiversity Management Plan (BMP) for the Proposed Development, along with the detailed mitigation measures for the construction and operational phases (Sections 11.12.2 and 11.12.3) and Biodiversity Enhancement Measures (Section 11.12.4).

In addition to the items listed below, this document should detail the landscape management operations for the Proposed Development, including cutting/trimming regimes and maintenance of bird and bat boxes (if applicable). This document will also be updated to reflect any follow-up survey results as they are carried out. The BMP will be prepared and agreed in consultation with a suitably qualified ecologist and Cork City Council.

Table 11.33 Mitigation and enhancement measures during the construction and operational phase as well as enhancement measures to be carried out by a suitably qualified ecologist (represented in green).

Measure	Monitoring
CONSTRUCTION PHASE	
Mitigation 1: Surface Water Protection	Mitigations consistent with those set out in Chapter 10, Water of this EIAR and in accordance with the accompanying CEMP.
Mitigation 2: Timing of works and vegetation clearance	Vegetation clearance to take place outside the bird nesting season (September to February inclusive) and in line with construction best practice.
Mitigation 3: Construction Phase Lighting	Avoidance of light spill into sensitive habitats and avoidance of impacts to nocturnal wildlife as set out in Section 11.11.2.4 above.
Mitigation 4: Waste Management	Designated areas for waste to be kept off ground level for wildlife protection in line with best practice.
Mitigation 5: Pre-Construction Amphibian, Reptile and Mammal Surveys	Pre-construction surveys will be carried out by the Ecologist prior to Site clearance to assess the likely presence of breeding birds, amphibians, common lizard and small mammals, with particular attention paid to all brash stockpiles and removable hedgerows on Site.
Mitigation 6: Reduction of Noise Related Impacts	Noise related impacts will be kept to a minimum in line with standard best practice to minimize disturbance and displacement effects on wildlife.
Mitigation 7: Invasive Species Management	Invasive species will be managed by a suitably qualified specialist, including the removal of high-impact cherry laurel and appropriate biosecurity measures.

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Measure	Monitoring
Operational Phase	
Mitigation 8: Surface Water Protection	Regular maintenance of surface water treatment facilities to ensure lifetime working operation.
Mitigation 9: Landscape Management	Pollinators will be promoted through the management of the soft landscaping on-Site during the lifetime of the development.
ENHANCEMENT	
Enhancement 1: Swift Bricks Installation	The location and placement of these structures should be carried out under the advisement and supervision of an Ecologist to ensure they are fit for purpose.
Enhancement 2: Bat box Installation	The location and placement of these structures should be carried out under the advisement and supervision of an Ecologist to ensure they are fit for purpose.
Enhancement 3: Amphibian and Reptile Hibernacula	2 no. enhancement areas for amphibian and reptiles.
Enhancement 4: Bee Hotels:	Nesting boxes designed for solitary bees will be installed within suitable areas of the Site, near areas of flowering meadows or within the central hedgerow spine.
Enhancement 5: Wildflower Meadow	Wildflower meadow will be implemented in line with the Proposed Landscape plan.

11.14 Residual Impact Assessment

This Section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

Standard construction phase control measures, and specific mitigation measures, have been outlined to ensure that the Proposed Development does not impact on any species, or habitats of conservation importance within the zone of influence of the Proposed Development. It is essential that these measures are complied with, in order to ensure that the Proposed Development complies with National conservation legislation. Provided all recommended measures are implemented in full and remain effective throughout the lifetime of the Proposed Development, no significant negative residual impacts on the local ecology, or on any designated nature conservation sites, will occur as a result of the Proposed Development.

Using sustainable surface water management and planting of native hedgerow, trees and pollinator friendly shrubs under the landscape plans, it is reasonable to state that the residual impacts arising following the implementation of mitigation and enhancement will be a positive outcome for Biodiversity on Site, creating a connected network of habitats on Site and connected into the broader landscape, particularly southwards through farmland and existing linear habitat features.

The installation of artificial nest sites for Swift will provide nesting opportunities for up to ten (15 no.) pairs of Red-listed swifts. Bat boxes will enhance the area for roosting bats which have been recorded foraging over hedgerow and scrub areas of the Site. Wildflower meadows and bee hotels will enhance the area for solitary bees. This residual impact will have a positive impact on the local population of the above species and contribute to their maintenance in the area.

11.15 Conclusion

The assessment of potential adverse impacts resulting from the Proposed Development on biodiversity in this chapter has identified KERs including habitats and Fauna. It is reasonably considered that following all mitigation measures including design embedded and prescribed, adequate implementation of the CEMP, and adherence to construction best practice that no significant effects to biodiversity will arise from the Proposed Development during the construction or operational phases.

Additionally, the landscape plan for the Proposed Development and the prescribed maintenance and landscape strategy will provide enhancement to biodiversity in local area over the long term.

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CHAPTER TWELVE

NOISE & VIBRATION

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McCutcheon Halley
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CHAPTER TWELVE

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CHAPTER 12 | Noise & Vibration

12.1 Introduction

This EIAR Chapter has been prepared by AWN Consulting Ltd (AWN) to assess the potential noise and vibration effects of the proposed development in the context of current relevant standards and guidance.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration impact associated with the proposed development, during both the short-term construction phase and the long-term operational phase. The assessment of direct, indirect and cumulative noise and vibration effects on the surrounding environment have been considered in this chapter. An inward noise impact assessment has also been undertaken to account for Waterfall Road and the N40 to the north of the proposed development and the steel works to the east of the proposed development.

A full project description is included in Chapter 2: Proposed Development, of this Environmental Impact Assessment Report (EIAR).

12.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Dominic Wright (Acoustic Consultant) who holds the Institute of Acoustics Diploma in Acoustics and Noise Control, along with a Diploma in Music Technology. With a background in audio engineering, he has over 3 years' experience working in the field of acoustics, contributing to various residential, industrial and infrastructure projects. He also has experience in both environmental noise surveying and modelling.

The chapter has been reviewed by Donogh Casey (Senior Acoustic Consultant) who holds the Institute of Acoustics Diploma in Acoustics and Noise Control, Donogh has worked in the field of acoustics since 2018 and has been a senior Acoustic Consultant since 2023. He is a member of the Institute of Acoustics and has extensive knowledge in the field of Building Acoustic design, environmental noise and vibration impact assessment, room acoustics, sound insulation and inward impact assessments.

12.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 'Proposed Development' of this EIAR. In summary, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the construction of 246 no. residential units, 1 no. creche and all associated ancillary development works at Ardarostig, Bishopstown, Cork.

12.4 Methodology

12.4.1 Assessment Overview

The following methodology has been prepared based on the requirements of the Environmental Protection Agency (EPA) Guidelines the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022) and on AWN's experience of preparing the noise and vibration chapters for similar developments. The following approach has been used for this assessment:

- Baseline noise monitoring has been undertaken at the development site to characterise the existing noise environment;
- A review of relevant standards and guidelines has been carried out to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- Predictive calculations have been performed to estimate the likely noise emissions during the construction phase of the proposed development at the nearest Noise sensitive Locations (NSLs) to the site;
- Predictive calculations have been performed to assess the potential effects associated with the operation of the proposed development at NSLs surrounding the site;
- An assessment has been completed of potential cumulative effects that may arise because of the proposed development and other existing or proposed plans and projects;
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development.
- The inward effect of noise from the surrounding environment into the proposed residential buildings has also been assessed to determine the requirements, for additional noise mitigation to ensure a suitable internal noise environment for residential amenity.

12.4.2 Criteria for Rating of Impacts

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. There are no statutory standards in Ireland relating to noise and vibration limit values for construction works or for environmental noise relating to the operational phase. In the absence of specific statutory Irish guidelines, the assessment has made reference to non-statutory national guidelines, where available, in addition to international standards and guidelines relating to noise and / or vibration impact for environmental sources.

In addition to specific noise and vibration guidance documents, the following EPA Guidelines the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022) were considered and consulted in the preparation of this Chapter.

The significance of noise and vibration effects has been assessed in accordance with the EPA 2022 Guidelines. With regard to the quality of the effect, ratings may have positive, neutral or negative applications.

12.4.3 Assessment Criteria and Guidelines – Construction Phase

Local Authorities typically control construction activities by imposing limits on the hours of construction and consider noise limits at their discretion. Construction noise sources include construction plant and machinery and construction related traffic on surrounding roads. Reference is made to the following guidelines and standards to inform the most appropriate construction noise and vibration significance thresholds and assessment methodologies:

- British Standard Institute (BSI) British Standard (BS) 5228-1:2009 +A1 2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (hereafter referred to as BS 5228–1) (BSI 2014a);
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (hereafter referred to as BS 5228 – 2) (BSI 2014b);
- BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (hereafter referred to as BS 7385–2). (BSI 1993);
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (hereafter referred to as BS 6472–1) (BSI 2008);

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- UK Highways England (now National Highways) (UKHE) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB Noise and Vibration) (UKHE 2020); and

12.4.3.1 Construction Noise

The British Standard BS 5228–1 (BSI 2014a) 'ABC' method is referenced here for the purposes of setting appropriate construction noise limits for the development. This is the most widely accepted standard for this purpose in Ireland.

The approach adopted calls for the designation of a noise sensitive location into a specific category (A, B or C) based on exiting ambient noise levels in the absence of construction noise. For the appropriate assessment period (i.e. daytime in this instance) the ambient noise level is determined and rounded to the nearest 5 dB. This then sets a threshold noise value that, if exceeded at this location, indicates a potential significant noise effect is associated with the construction activities, depending on context. Note that, in accordance with the BS5228-1 guidance, this assessment criterion is only applicable to residential receptors.

Table 12.1 sets out the construction noise thresholds (CNTs) at the façade of residential receptors for the different baseline noise categorises from BS 5228-1.

Table 12.1 Threshold of Potential Significant Effect at Dwellings

Assessment Category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A [A]	Category B [B]	Category C [C]
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and weekends D	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

- Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.
- Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.
- Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

12.4.3.2 Proposed Threshold Noise Levels

Taking into account the proposed documents outlined above and making reference to the baseline noise environment monitored around the development site (see section 12.6.1), BS 5228-1 has been used to inform the assessment approach for construction noise.

The following Construction Noise Threshold (CNT) levels are proposed for the construction stage of this development:

- For residential NSLs in proximity to the main site development works, Category A values are deemed appropriate using the ABC method.
- For commercial premises, the Category C value is considered an appropriate threshold value.
- There are no scheduled night-time construction works proposed as part of the proposed development.

12.4.3.3 Significance of Construction Noise Levels (CNL)

In order to assist with interpretation of significance relating a calculated construction noise level (CNL), Table 12-2 includes guidance as to the likely magnitude of impact associated with construction noise, relative to the CNT. This guidance is derived from DMRB: Noise and Vibration (UKHE 2020) and adapted to include the EPA EIAR Guidelines.

Table 12.2 Construction Noise Significance Ratin

Construction Noise Level per Period	Guidelines for Noise Impact Assessment Significance (DMRB)	EPA EIAR Significance Effects	Determination
Below or equal to baseline noise level	Negligible	Not Significant	Depending on CNT, duration & baseline noise level
Above baseline noise level and below or equal to CNT	Minor	Slight to Moderate	
Above CNT and below or equal to CNT +5 dB	Moderate	Moderate to Significant	
Above CNT +5 dB	Major	Significant, to Very Significant	

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely effects during the construction stage.

In accordance with the DMRB Noise and Vibration Guidance, construction noise and construction traffic noise effects shall constitute a significant effect where it is determined that a major or moderate magnitude of effect will occur for a duration exceeding:

- Ten or more days or night in any 15 consecutive day or nights, or
- A total number of days exceeding 40 in any six consecutive months.

12.4.3.4 Construction Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. For the purpose of the proposed development, the range of relevant criteria used for surface construction works for both building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

Peak Particle Velocity (PPV) is a measure of the velocity of vibration displacement in terms of millimetres per second (mm/s). It is defined as follows within BS 7385-2 (BSI 1993) as 'the maximum instantaneous velocity of a particle at a point during a given time interval'.

Building Response

There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 5228-2 (BSI 2014b); and
- British Standard BS 7385-2 (BSI 1993)

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BS7385-2 (BSI 1993) and BS5228-2 (BSI 2014b) advise that, for soundly constructed residential properties and similar light-framed structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above for transient vibration. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table B.2 of BS5228-2 (BSI 2014b) might need to be reduced by up to 50%. On a cautious basis, therefore, continuous vibration limits are set as 50% of those for transient vibration across all frequency ranges. For buildings or structures that are structurally unsound, lower vibration magnitudes will apply, typically 50% of those for structurally sound buildings. Protected or historic buildings are not automatically assumed to be more vulnerable to vibration unless they have existing structural defects. The recommend transient vibration thresholds from BS5228-2 (BSI 2014b) for the avoidance of cosmetic damage to light framed and residential buildings are summarised in Table 12-3.

Table 12.3 Recommended Construction Vibration Threshold for Control of Building Damage

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of: -		
Less than 15Hz	**15 to 40Hz**	**40Hz and above**
15mm/s	20mm/s	50mm/s

Human Response

Human response to vibration stimuli occurs at orders of magnitude below those associated with any form of building damage, hence vibration levels lower than those indicated in Table 12-3 can lead to concern. Table 12-4 presents the significance table relating to potential effects to building occupants during construction based on guidance from BS5228-2 (BSI 2014b), the DMRB Noise and Vibration (UKHE 2020) document and the associated EPA significant ratings.

Table 12.4 Guidance on Effects of Human Response to PPV Magnitudes

Vibration Level, mm/s PPV	Description of Effect	Possible Significance Rating
≥10 mm/s PPV	Vibration is likely to be intolerable for any more than a brief exposure to a level of 10 mm/s	Very Significant
≥1 mm/s PPV to <10 mm/s PPV	Increasing likelihood of complaints in residential environments but can be tolerated at the lower end of the scale if prior warning and explanation has been given to residents	Significant to Very Significant
≥0.3 mm/s PPV to <1 mm/s PPV	Increasing likelihood of perceptible vibration in residential environments	Slight to Moderate
<0.3 mm/s PPV	Vibration is unlikely to be perceptible in even the most sensitive situations for most vibration frequencies associated with construction	Not Significant

Notes from BS5228-2:

- A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.
- B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.
- C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472 (BS1 2008), and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

12.4.3.5 Construction Phase Traffic Noise

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced: DMRB Noise and Vibration (UKHE 2020) and the EPA Guidelines (EPA, 2022). For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the 'short term' period in accordance with the DMRB Noise and Vibration (UKHE 2020) document.

Table 12-5 sets out the classification of changes in noise level to impact on human perception based on the guidance contained in these documents.

Table 12.5 Classification of Magnitude of traffic noise changes for Construction Traffic

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant to Slight
3 – 4.9	Perceptible	Moderate	Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

12.4.4 Assessment Criteria and Guidelines – Operational Phase

The main potential source of outward noise from the proposed development will be limited to traffic flows to and from the development site onto the public roads. There may also be an element of mechanical and electrical plant required to service the apartment buildings. The relevant guidance documents used to assess potential operational noise and vibration impacts on the surrounding environment are summarised below.

- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (hereafter referred to as BS 8233) (BSI 2014c);
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (hereafter referred to as BS 4142) (BSI 2019);
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (hereafter referred to as ISO 1996 – 1) (ISO 2016);

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- International Organization for Standardization (ISO) 9613-2: 2024: Acoustics – Attenuation of sound during propagation outdoors, Part 2: Engineering method for the prediction of sound pressure levels outdoors (hereafter referred to as ISO 9613 – 2) (ISO 2024);
- The UK Department of Transport Calculation of Road Traffic Noise (hereafter referred to as the CRTN) (UK Department of Transport 1988).
- UK Highways England (UKHE) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (UKHE 2020);
- ANC, IOA & CIEH (2017). ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise – New Residential Development (hereafter referred to as ProPG: Planning and Noise).

12.4.4.1 Operational Phase Traffic Noise

Vehicular movement to and from the proposed development will make use of the existing road network and new junction arrangement. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to consider the increase in traffic noise level that arises as a result of any additional vehicular movements associated with the development.

In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced DMRB Noise and Vibration (UKHE 2020) and the EPA EIAR Guidelines (EPA, 2022) which categorise the magnitude of effect relating to changes in road traffic. For the operational phase, traffic noise impacts are assessed against the 'long term' magnitude ratings from the DMRB. These are discussed in Table 12-6.

Table 12.6 Likely Impact Associated with Change in Traffic Noise Level

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Long-term)	EPA Significance of Effect
0	Inaudible	No impact	Imperceptible
0.1 – 2.9	Barely Perceptible	Negligible	Not significant
3 – 4.9	Perceptible	Minor	Slight, Moderate
5 – 9.9	Up to a doubling of loudness	Moderate	Moderate to Significant
10+	Doubling of loudness and above	Major	Significant to Very significant

12.4.4.2 Mechanical and Electrical Services Criteria

The proposed development is residential in nature. There will be minimal mechanical and / or electrical plant items required to service the development that will generate any audible noise levels outside of the site boundary or at the developments buildings themselves. Plant contained within enclosed plant rooms has the least potential for impact, once consideration is given to appropriate design of the space.

The closest noise sensitive locations to any operational plant items are the residential dwellings within the proposed development. To ensure there is no adverse impact on the future inhabitants of the proposed development itself, it is appropriate to refer to internal noise targets derived from BS 8233 (BSI 2014c). The recommended indoor ambient noise levels are set out in and are based on annual average data.

Table 12.7 Guidance on Indoor Ambient Noise Levels for Dwellings

Activity	Location	Daytime (07:00 to 23:00hrs)	Night (23:00 to 07:00hrs)	Derived External Levels
Resting	Living Room	35 dB $L_{Aeq,16hr}$	-	45 dB $L_{Aeq,16hr}$
Dining	Dining Room	40 dB $L_{Aeq,16hr}$	-	50 dB $L_{Aeq,16hr}$
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$	45 dB $L_{Aeq,16hr}$ (40 dB $L_{Aeq,8hr}$ at night)

The derived external levels are based on the approximate attenuation provided by a partially open window of approximately 15 dB, as advised in BS 8233, and represent the appropriate noise level at the external façade of the building. For the purposes of a conservative assessment an attenuation value of 10dB has been used to derive the external noise levels. Using this correction value, the following external noise levels would achieve the internal noise levels noted in Table 12-7 above.

- Daytime / Evening (07:00 to 23:00 hours) 45 dB $L_{Aeq,1hr}$
- Night-time (23:00 to 07:00 hours) 40 dB $L_{Aeq,15min}$

Once operational noise levels within the proposed residential units are controlled to within the design criteria discussed above, operational noise emissions to the surrounding environment will be minimal. The operational noise impact to the surrounding existing NSLs is therefore not significant.

12.4.4.3 Operational Phase – Vibration Criteria

There are no sources of vibration associated with the operational phase, therefore, vibration criteria have not been specified for this phase.

12.4.5 Criteria for Assessing Inward Noise Impacts

12.4.5.1 Cork Agglomeration Noise Action Plan

The Cork Agglomeration Noise Action Plan was revised in 2024. To assist local authorities and in the absence of Irish planning guidance the Draft Interim National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development was compiled in 2021 by the NIECE Local Authority Noise Subgroup recommends:

> *"consideration is given to the potential impact of transportation noise in line with Professional Planning Guidance (ProPG) on Planning & Noise: New Residential Development (ProPG, 2017)."*

Section 7.5 of the NAP sets out the approach for minimising the adverse impacts of noise without placing unreasonable restrictions on development. For the scenario where new developments are developed close to existing noise sources, e.g. new housing, hospitals, school, nursing home etc developments near to existing road, rail, industry etc. The NAP notes:

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"to effectively employ the planning process for consistent noise exposure avoidance or mitigation, it is deemed beneficial to incorporate guidelines on noise exposure levels during the initial proposal and design phase of planning applications. Descriptions of guidance adopted in the Agglomeration is set out below"

The guidance documents referred to in 7.5.1 to 7.5.4 of the NAP relate to residential development to control noise levels both within internal noise sensitive areas and within external amenity areas.

The NAP also states the following:

"Applications for new residential developments in the Agglomeration will be assessed in accordance with the policies and goals outlined in the relevant City and County Development Plans. Where applicable, these include adoption of the principles of Professional Planning Guidance (ProPG) on Planning & Noise: New Residential Development, as described in Section 7.5.1.

Where the assessment outcome determines the likelihood of an adverse noise impact, planning applications should be supplemented by an Acoustic Design Statement carried out by appropriately qualified acousticians and competent persons. The Acoustic Design Statement should demonstrate that all facets of ProPG have been followed."

In accordance with this NAP policy, a ProPG Acoustic Design Statement (ADS) and assessment has been prepared as part of this chapter to comply with the requirements of the NAP.

12.4.5.2 Professional Practice Guidance on Planning and Noise (ProPG:2017)

The Professional Practice Guidance on Planning & Noise (ProPG) document was published in May 2017. The document was prepared by a working group comprising members of the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH). Although not a government document, since its adoption it has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance.

The ProPG outlines a systematic risk-based 2-stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

- Stage 1 - Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and,
- Stage 2 – Involves a full detailed appraisal of the proposed development covering four "key elements" that include:
  - » Element 1 - Good Acoustic Design Process;
  - » Element 2 - Noise Level Guidelines;
  - » Element 3 - External Amenity Area Noise Assessment
  - » Element 4 - Other Relevant Issues

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk based on the pre-existing noise environment. Figure 12-1 presents the basis of the initial noise risk assessment; it provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

It should be noted that a site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times a night.

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233 (2014). The recommended indoor ambient noise levels are set out in Table 12-8 and are based on annual average data, that is to say they omit occasional events where higher intermittent noisy events may occur.

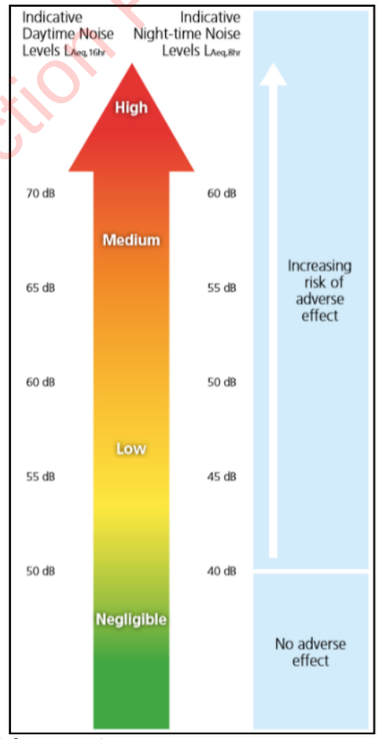


Figure 12.1 ProPG Stage 1 – Initial Noise Risk Assessment

Table 12.8 ProPG Internal Noise Levels

Activity	Location	Daytime (07:00 to 23:00hrs)	Night (23:00 to 07:00hrs)	Derived External Levels
Resting	Living Room	35 dB $L_{Aeq,16hr}$	-	50 dB $L_{Aeq,16hr}$
Dining	Dining Room	40 dB $L_{Aeq,16hr}$	-	55 dB $L_{Aeq,16hr}$
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$	50 dB $L_{Aeq,16hr}$ (45 dB $L_{Aeq,8hr}$ at night)

In addition to these absolute internal noise levels ProPG provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5 dB can still provide reasonable internal conditions.

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ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

> *"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."*

12.5 Difficulties Encountered

There were no significant difficulties encountered in compiling the specified information for this EIAR chapter. The assessment has been completed using the information provided by the design team.

12.6 Baseline Environment

The proposed development is situated at Ardarostig within the townlands of Bishopstown, Cork.

To the north of the proposed development lies the N40 and waterfall road which border the site along its entire northern edge. To the west are other residential developments currently under construction, to the east, the site is further bordered by a mix of industrial and commercial units and residential units. To the south lies a mixture of greenfield agricultural lands.

Figure 12.2 demonstrates the indicative area of the proposed development.

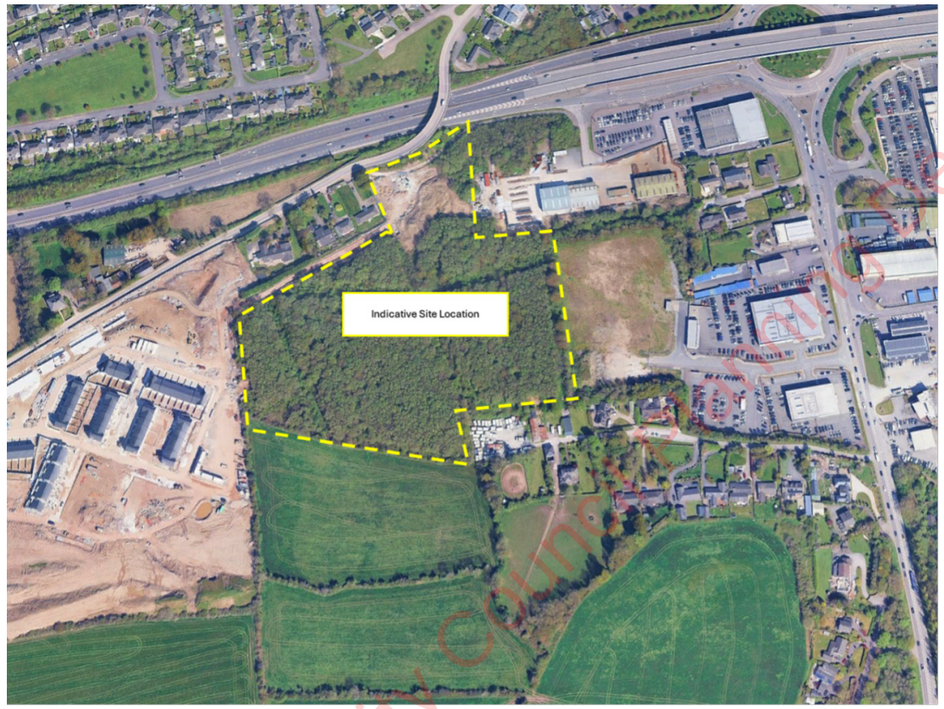


Figure 12.2 Indicative Site Location

12.6.1 Baseline Noise Survey

An environmental noise survey has been conducted at the site to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. Specific details are set out below.

12.6.1.1 Choice of Measurement Locations

The measurement locations were selected to represent the noise environment at noise-sensitive locations both surrounding the proposed development and future noise sensitive areas within the proposed development. The selected measurement locations are shown in Figure 12-3 and described as follows:

UN1 Located to the northern boundary of the site, this unattended noise monitor was installed to characterise the prevailing noise environment emanating from the road traffic along the N40 that will affect the façades of the proposed residential buildings in this area of the site.

AT1 Located at residential properties to the east of the site, an attended noise survey was undertaken at this location to measure noise levels representative of the residential properties bordering the site.

AT2 Located to the west of the site, this location is representative of residential properties located along waterfall road.

Figure 12.3 Noise Monitoring Locations

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12.6.1.2 Survey Periods

Unattended Surveys

Unattended measurements at location UN1 were carried out from 10:45hrs on 17th April 2025 to 16:14hrs on 23rd April 2025. The weather during the survey period was mostly unsettled and overcast, with wind speeds not exceeding 5m/s.

According to Met Eireann's available data, rainfall was recorded during the following periods:

- 22:00hrs to 00:00hrs on 17th April 2025.
- 00:00hrs to 15:00hrs and 22:00hrs to 00:00hrs on 18th April 2025.
- 00:00hrs to 13:00hrs and 18:00hrs to 00:00hrs on 19th April 2025.
- 00:00hrs to 11:00hrs and 22:00hrs to 00:00hrs on 20th April 2025.
- 07:00hrs to 16:00hrs on 22nd April 2025.

Attended Surveys

Attended noise surveys were undertaken from 11:45 – 14:15 on the 17th April 2025.

Survey periods for all measurements were 15 minutes. The measurements represent typical periods that were selected in order to provide a snapshot of the existing noise climate.

12.6.1.3 Personnel and Instrumentation

Alex Round (AWN) conducted measurements during the survey periods.

The unattended and attended noise surveys were undertaken using Rion NL-52 sound level meters. The measurement apparatus was check calibrated both before and after each survey using a Rion Type NC-75 Sound Level Meter Calibrator. Calibration certificates of the monitoring equipment are included within Appendix A. The specific equipment details are summarised in Table 12-9.

Table 12.9 Noise Monitoring Equipment

Equipment	Serial Number	Calibration Date
Rion NL-52	1076328	09/09/2024
	586940	20/02/2024
Rion NC-75	34313057	28/11/2024

For unattended noise surveys, a Rion WS-15 Outdoor Microphone Protection System was used with microphone extension cable and outdoor peli-case.

12.6.1.4 Noise Measurement Parameters

The noise survey results are presented in terms of the following parameters:

- L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
- L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.
- L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix for the noise parameters denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2 x 10^{-5} Pa.

12.6.1.5 Noise Survey Results

The survey results for the monitoring locations have been summarised for each day and night-time period. Daytime is defined as the 16-hour period between 07:00 and 23:00hrs and night-time is defined as the 8-hour period between 23:00 and 07:00hrs. It should be noted that a logarithmic average is used for the L_{Aeq} parameter, while an arithmetic average is used for the L_{A90} parameter. L_{Amax} values are presented as a range.

12.6.1.5.1 Location UN1

The survey results for Location UN1 are graphed in Figure 12-4 and summarised in Table 12-10

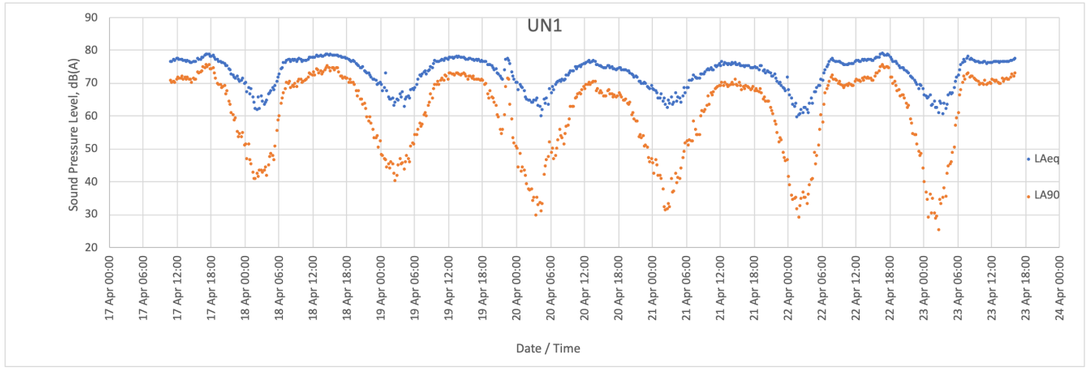


Figure 12.4 Graphed Measured Levels at UN1

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Table 12.10 Summary of Survey Results for Location UN1

Location	Date	Period	Measured Noise Levels (dB re. 2x10-5 Pa)		
			L_{Aeq}	L_{Amax}	L_{A90}
UN1	17th April 2025	Day	77	82 – 89	70
		Night	70	80 – 89	50
	18th April 2025	Day	77	81 – 95	70
		Night	68	79 – 100[1]	48
	19th April 2025	Day	76	80 – 90	68
		Night	68	78 – 88	43
	20th April 2025	Day	74	81 – 88	63
		Night	67	80 – 91	43
	21st April 2025	Day	74	80 -94	65
		Night	68	78 – 101	44
	22nd April 2025	Day	77	81 – 96	69
		Night	69	79 – 86	43
	23rd April 2025	Day	77	83 – 94	71
	17th April – 23rd April 2025	Average Day	76	--	68
		Average Night	68	--	45

The main sources noted noise sources at the monitoring location upon install and collection was dominant road traffic from the N40. Other noise sources recorded were intermittent air traffic, birdsong, pedestrians passing and foliage rustling in the wind intermittently.

12.6.1.5.2 Location AT1

The survey results for Location AT1 are presented in Table 12-11.

Table 12.11 Summary of Survey Results for Location AT1

Date / Time		Measured Noise Levels (dB re. 2x10-5 Pa)		
		$L_{Aeq,15\ mins}$	L_{Amax}	$L_{A90,\ 15\ mins}$
17/04/2025	11:45	52	71	42
	12:45	47	63	43
	13:45	50	72	45

Noise noted at location AT 1 was dominated by distant road traffic noise from the N40, local traffic movements and influence from faint noise from a nearby building services plant. Other noise sources noted included bird song as well as intermittent air traffic and pedestrian chatter.

1 Short peaks in noise level from unknown source. However, the higher recorded L_{Anax} levels do not effect the measured L_{Aeq} and L_{A90} levels recorded during the periods which remain consistent throughout the measurement period.

Increased local road traffic and car doors being slammed intermittently were observed during the third measurement period. Ambient noise levels were measured in the range of 47 to 52 dB $L_{Aeq.}$ Background noise levels were in the range 42 to 45 dB $L_{A90.}$

12.6.1.5.3 Location AT2

The survey results for Location AT2 are presented in Table 12-12.

Table 12.12 Summary of Survey Results for Location AT2

Date / Time		Measured Noise Levels (dB re. 2x10-5 Pa)		
		$L_{Aeq,15\ mins}$	L_{Amax}	$L_{A90,\ 15\ mins}$
17/04/2025	12:15	64	83	47
	13:15	61	74	48
	14:15	59	74	46

Noise noted at location AT 2 was dominated by distant road traffic noise from the N40, local traffic movements and influence from construction works at a nearby house. Other noise sources noted were attributed to intermittent air traffic.

Ambient noise levels were measured in the range of 59 to 64 dB $L_{Aeq.}$ Background noise levels were in the range 46 to 48 dB $L_{A90.}$

12.6.1.6 Desktop Noise Review

A desktop review of publicly available data has been undertaken to further characterise the baseline noise environment in the study area. Reference has been made to the most recent Round 4 noise maps published by the Environmental Protection Agency (EPA) (http://gis.epa.ie) for road traffic noise within the Cork City Agglomeration. The published noise maps are provided for the overall day-evening-night period in terms of L_{den} and the L_{night} parameters, defined below.

L_{den} is the 24-hour noise rating level determined by the averaging of the L_{day} with the $L_{evening}$ (plus a 5 dB penalty) and the L_{night} (plus a 10 dB penalty). L_{den} is calculated using the following formula:

Where:

$$L_{den} = 10log\left(\frac{1}{24}\right)\left(12 * \left(10^{\frac{Lday}{10}}\right) + 4 * \left(10^{\frac{Levening+5}{10}}\right) + 8 * \left(10^{\frac{Lnight+10}{10}}\right)\right)$$

L_{day} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all day periods of a year. The 12-hour daytime period is between 07:00hrs and 19:00hrs.

$L_{evening}$ is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the evening periods of a year. The four-hour evening period is between 19:00hrs and 23:00hrs.

L_{night} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the night periods of a year. The eight-hour night-time period is between 23:00hrs and 07:00hrs.

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Figure 4 and Figure 5 present the mapped road traffic noise levels in the vicinity of the development site in terms of the L_{den} and L_{night} parameters. The main contributor in relation to road noise is from the N40 to the north of the site.

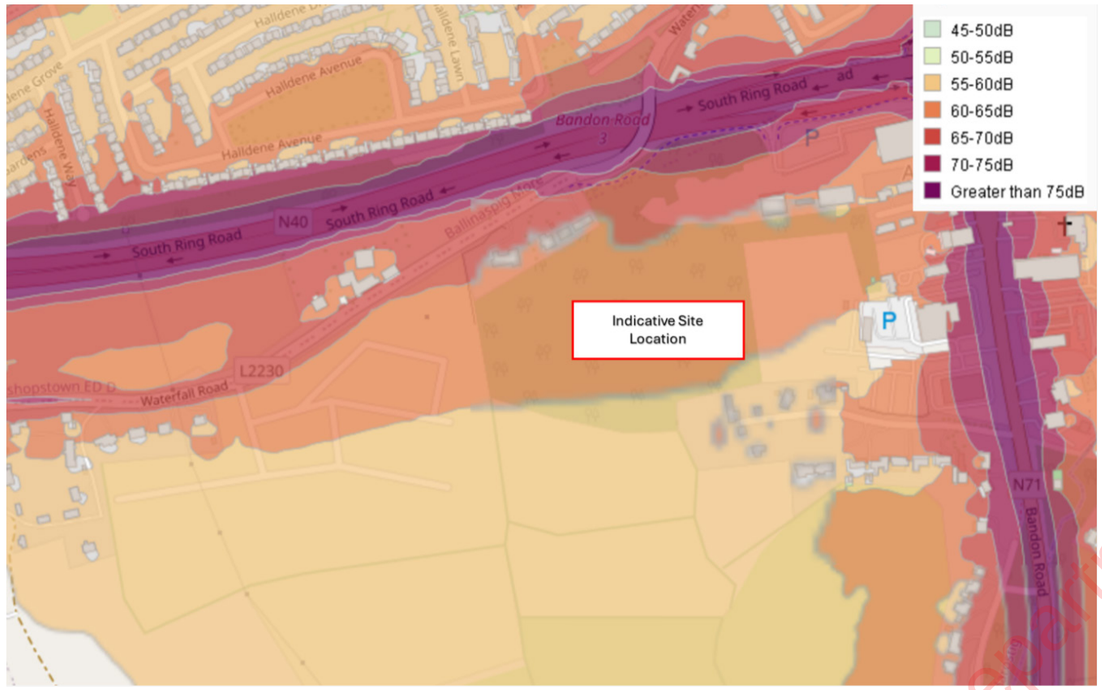


Figure 12.5 Mapped L_{den} Traffic Noise Level within vicinity of proposed development

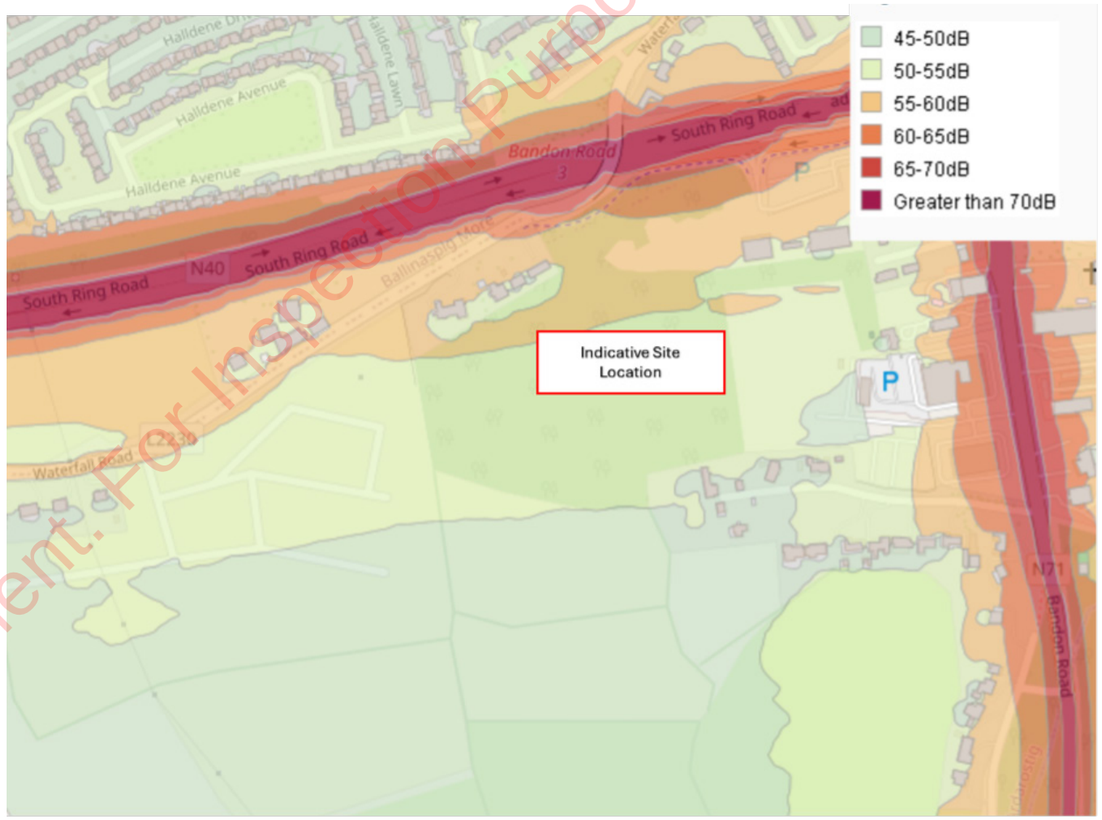


Figure 12.6 Mapped L_{night} Traffic Noise Level within vicinity of proposed development

The EPA noise maps indicate that, at the immediate boundary of the N40 where position UN1 was installed the noise levels fall within the 70–75 dB L_{den} contour. Further in from the carriageway edge, the majority of the site is subject to road noise from the N40. The maps show that levels range from 65 to 70 dB L_{den} along the northern boundary of the site, reducing to within the 60 to 65 dB L_{den} contour further into the site. The remainder of the site is largely mapped within the 55 to 60 dB L_{den} noise contour.

During the night-time period, the EPA noise maps indicate that levels range from 60 to 65 dB L_{night} at the carriageway edge where UN1 was installed to 55 to 60 dB L_{night} along the northern boundary of the site, reducing to within the 50 to 55 dB L_{night} contour further into the site. The remainder of the site is largely mapped within the 45 to 50 dB L_{night} noise contour.

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12.6.1.7 Baseline Noise Summary

The baseline noise environment across the site is dominated by road traffic along the northern boundary and reduces moving south into the site. The measured and mapped noise levels indicate that noise control measures will be required along the northern site boundary to reduce traffic noise levels at the closest residential buildings and external amenity areas. The use of enhanced acoustic measures to the facades of the development buildings will be reviewed as part of the impact assessment to control internal noise levels. Whilst not noted within the surveyed notes other potential noise sources on the proposed development are the existing pump station to the north of the development and Heiton Steel to the east of the apartment blocks within the proposed development.

12.7 The 'Do Nothing' Scenario

In the absence of the proposed project, the existing noise and vibration levels within the study area are expected to remain largely unchanged. The current baseline conditions characterised by the noise surveys within Section 12.6.1 will continue to prevail.

12.8 Characteristics of the Proposed Development

The proposed development comprises a mix of residential units and all associated site works.

When considering a development of this nature, the potential noise and vibration impact on the surroundings must be considered for each of two distinct stages:

- the construction and demolition phase, and;
- the operational phase.

The proposed development consists of the construction of 246 no. residential units consisting of houses and apartments and the provision of 1 no. creche. A full description is included in Chapter 2 of the EIAR and in the statutory notices.

12.8.1 Construction Phase

The highest potential noise and vibration impact of the proposed development will occur during the construction phase due to the activity of mobile and construction plant items with high noise levels. The outline CEMP for the proposed development outlines various construction phases of different time frames. The Phase 0a site set up is due to occur over a 3-week period whilst the setting out of provisions of services is likely to take approximately between 12 to 18 months. The construction of the residential units is anticipated to occur over phases 1, 2 and 3 which will occur over a 24 month period. The effects from construction across the above time periods is deemed short term in nature.

During the construction phase, activities will involve site set up which will include site clearance, the setting out site provisions of services works which will require extensive excavation, laying of sewers and works associated with the internal road works. Following this structural and building works associated with the residential units will be undertaken. For each stage there will be on-site plant and equipment operating in addition to construction traffic including movement of machinery and materials within and to and from the construction site. It is planned to construct the proposed development over 3 phases.

A variety of items of plant will be in use during these construction work all of which have the potential to generate high levels of noise. These will include excavators, piling rigs, loaders, dozers, cranes and static plant such as generators, compressors and pumps.

Vibration associated with the proposed construction site activities will be low due to the distance between the works and the nearest structures and buildings.

The potential impact associated with these above activities are discussed in the following sections.

12.8.2 Operational Phase

Once operational, there are no major noise sources associated with the proposed development which is residential in nature. The range of operational activities will be limited to local vehicle movements, amenity areas and Creche areas etc. None of these activities are associated with any significant noise effects to the surrounding noise environment. The main potential source of outward noise from the proposed development is associated with traffic flows to and from the development site on the surrounding road network. There will also be potential for an element of mechanical and electrical plant required to service the residential units and creche within the proposed development.

There is also the impact of Inward noise incident on the development from existing and future noise sources, namely road traffic noise from the N40 this has also been assessed.

12.9 Potential Significant Effects

12.9.1 Construction Phase

12.9.1.1 Closest NSLs and Noise Thresholds

The construction of the proposed development will occur over three construction phases. The proposed construction phasing program is highlighted below in as the works in each phase are completed the residential units within the completed phases, once occupied, will become NSLs.

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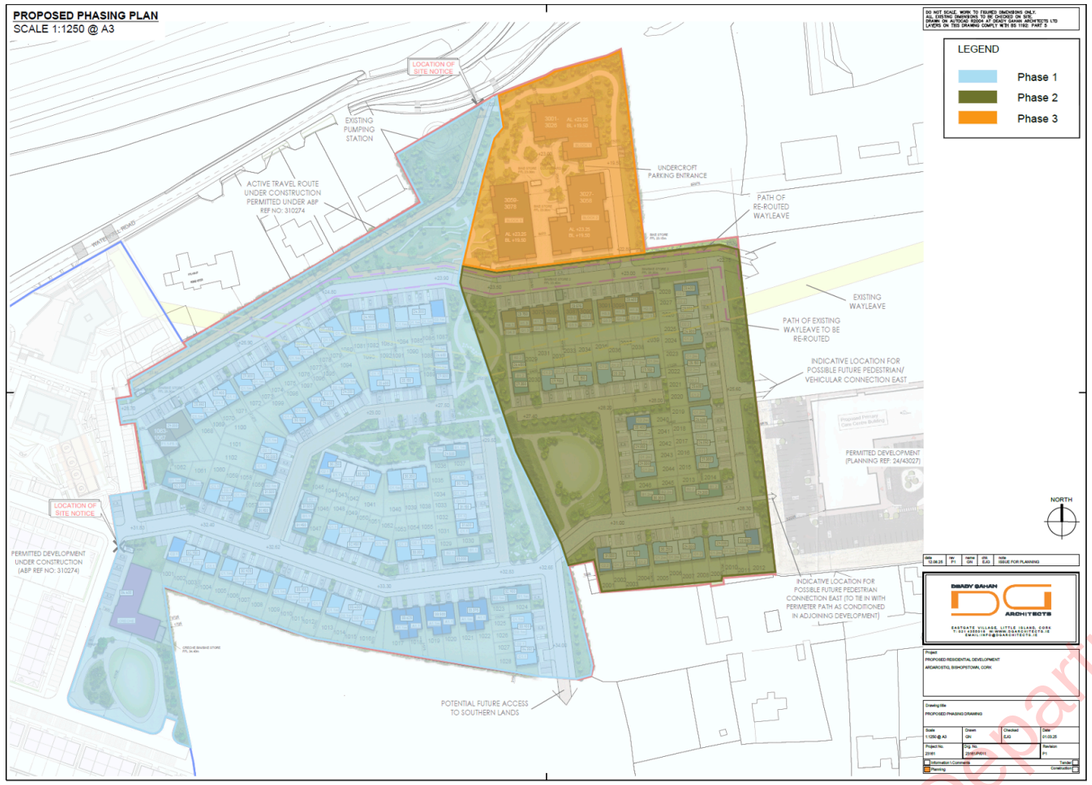


Figure 12.7 Proposed Construction Phasing for Proposed Development

Figure 12-8 illustrates the location of the closest NSLs in the surrounding environment. These NSLs are also discussed below in relation to their position with the proposed development.

NSL 1 – These NSLs are to the north west of the proposed development along Waterfall Road, they are at varying distances with the closest NSLs approximately 10m from the redline boundary of the site and 40m from the closest structural works associated with the construction of the residential units.

NSL 2 - These NSLs are located in a residential housing development to the east of the proposed development along Ardrostig Lane. The closest of these NSLs is approximately 15m from the redline boundary of the site and 30m from the closest structural works associated with the construction of the residential units.

NSL 3 - These NSLs are to the east of the proposed development within the permitted development of a primary care centre (Planning Ref 24/43017). For the purposes of this assessment a conservative assumption is taken that this centre will be operational during the construction of the proposed development under assessment. The permitted development is approximately 25m from the redline boundary of the site and 45m from the closest structural works associated with the construction of the residential units.

NSL 4 - These NSLs are to the west of the proposed development within the waterfall heights residential development currently under construction. For the purposes of this assessment a conservative assumption is taken that these units will be operational and residential during the construction of the proposed development under assessment. The closest of these NSLs is approximately 20m from the redline boundary of the site and 30m from the closest structural works associated with the construction of the residential units.

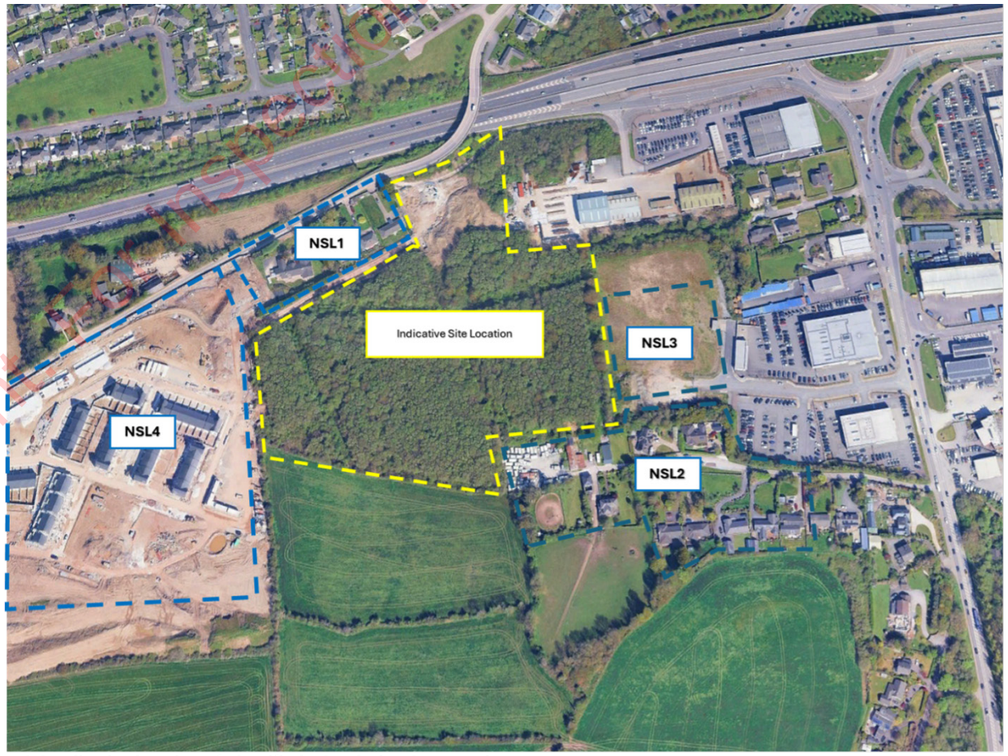


Figure 12.8 Indicative location of Identified NSLs during Construction

The construction noise threshold is determined by referring to Table 12-1 (BS 5228-1) and the baseline ambient noise levels (as referred to in Section 12.6.1), as outlined in the assessment criteria section.

The standard working hours for the proposed development are defined within the outline CEMP as follows:

- Monday to Friday: 07:00 to 19:00hrs;
- Saturdays: 08:00 to 16:00hrs,

Should there be a requirement for works outside of the normal working hours a written submission seeking authorisation will be made to Cork City Council.

Based on the prevailing noise environment measured, the construction noise thresholds are defined from Category A and Category B as appropriate and defined within Table 12-1. NSL group 1 along waterfall road are defined as being within category

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B based on the prevailing ambient noise levels measured at location AT2 with all other residential NSLs defined as being within Category A based on the prevailing ambient noise levels.

Category A sets the following construction noise thresholds for NSL group 2,3 and 4:

- Monday to Friday (07:00 – 19:00) **65 dB $L_{Aeq,T}$**
- Saturdays (07:00 – 13:00hrs) **65 dB $L_{Aeq,T}$**
- Evening and Saturday (13:00 – 23:00hrs) **55 dB $L_{Aeq,T}$**

Category B sets the following construction noise thresholds for NSL group 1:

- Monday to Friday (07:00 – 19:00) **70 dB $L_{Aeq,T}$**
- Saturdays (07:00 – 13:00hrs) **70 dB $L_{Aeq,T}$**
- Evening and Saturday (13:00 – 23:00hrs) **60 dB $L_{Aeq,T}$**

12.9.1.2 Source Noise Levels

Since the construction programme has been established in outline form, construction noise associated with activities on site during each construction phase are reviewed for the purposes of determining the likely significant effects. Indicative ranges of noise levels associated with construction may be calculated in accordance with the methodology set out in BS 5228-1. This standard sets out sound power and sound pressure levels for plant items normally encountered on construction sites, which in turn enables the prediction of noise levels.

Given that the construction stage is highly transient in nature and involves a number of various stages which will encompass a range of different activities on a day to day and week to week basis, it is not possible to calculate with a high degree of accuracy the specific levels of noise associated with each stage. The construction stage will be undertaken over a number of stages from site set up and the setting out of services through to building construction and internal fit out. Expected typical levels of noise associated with the key stages of work are discussed below. For the purposes of this assessment the various phases of construction have been split into three distinct phases, the site set up and clearance works, the more noise intrusive provisions of the services to the site and the general construction anticipated to take place on a development of this nature.

12.9.1.2.1 Site Set Up and Clearance

For site set up and clearance the works will involve the removal of any vegetation within the site as well as the construction of a site office and compound. The provision of temporary foul and storm sewers will also be provided for the site office during this phase. Reference to BS 5288-1 indicates that highest noise levels during this phase will be associated with activities associated with the ground clearance phase activities. Noise levels from these activity types are typically in the range of 80 to 90 dB L_{Aeq} at 10m.

For construction activities associated surface ground clearance, a total construction noise level of 92 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations. This would involve for example, one item of plant at 90 dB L_{Aeq} and two items of plant at 85 dB L_{Aeq} and one item of plant at 80 dB L_{Aeq} operating simultaneously within one work area which is considered a worst-case scenario.

12.9.1.2.2 Provision of Services to the Site

For the provision of services to the site typical plan items will include excavators, loaders, dozers, concreting works, mobile cranes and generators. Noise source levels are quoted in the range of 70 to 80 dB L_{Aeq} at distances of 10 m within BS 5228-1.

For the purposes of this assessment, a combined sound pressure level of 85 dB $L_{Aeq,T}$ at 10m has been used for construction noise calculations. This would include, for example, 2 no. items of construction plant with a sound pressure level of 80 dB L_{Aeq} at 10 m and 3 no. items of plant with a sound pressure level of 75 dB L_{Aeq} at 10 m, resulting in a total noise level of 85 dB L_{Aeq} at 10m along the closest works boundary.

12.9.1.2.3 General Construction

Once the ground preparation and foundation works have been completed, a large portion of the work will involve manual labour and cranes with lower overall noise levels. For the purpose of this assessment a combined sound pressure level of 78 dB $L_{Aeq,T}$ at 10m has been used for construction noise calculations during ongoing site works and compounds once site clearance and excavation works are completed. This would include, for example, one item of plant at 75 dB L_{Aeq} and three items of plant at 70 dB L_{Aeq} operating simultaneously within a work area resulting in a total noise level of 78 dB L_{Aeq} along the closest works boundary.

Given the nature of the proposed works which will include standard house and apartment building techniques across the site, the cumulative construction noise levels above represent conservative noise levels used to assess construction activities associated with the various stages of construction. This worst-case scenario is a robust assumption made for developments of this size, on the basis that it is unlikely that more than 5 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other at all times. In reality items of construction plant and machinery will be operating at varying distances from any one NSL.

12.9.1.3 Construction Noise Calculations

Construction noise levels have been calculated at the closest NSLs, assuming the construction noise levels discussed above. For the purpose of the assessment, partial site screening (5 dB) has been assumed from the use of a standard site hoarding of 2.4 m high for noise sensitive boundaries. The calculations also assume that the equipment will operate for 66% of the working time over a construction working day. Table 12-13 summarises the result of this assessment.

Table 12.13 Indicative Construction Noise Levels at Varying Distances

Construction Phase	Cumulative Sound Pressure, dB $L_{Aeq,T}$ at 10m	Calculated Noise Levels at Varying Distances, dB $L_{Aeq,T}$							
		10m	15m	20m	25m	50m	70m	90m	100m
Site Set Up and Clearance	**92**	85	81	79	77	71	68	66	64
Provision of Site Services	**85**	78	74	72	70	64	61	59	57
General Construction	**78**	71	67	65	63	57	54	52	50

12.9.1.3.1 Site Set Up and Clearance Noise

During the site setup phase, the closest NSLs will be approximately 10 m away, with closest NSLs being within NSL Group 1 at the site boundaries along waterfall road. The potential effect during the site setup and clearance phase at properties nearest to the construction works is likely to be brief to temporary, negative, and significant to very significant.

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Category A construction noise thresholds will be exceeded up to distances of 100 m, while Category B thresholds will be exceeded up to 70 m. All NSL groups fall within these distance bands and will therefore experience a significant to very significant effect in relation to site setup and clearance noise.

This assessment is highly conservative, based on the assumption that the most noise-intrusive activities will occur within 10 m of the nearest NSLs. It is also conservative in assuming that site setup and clearance activities will exceed the durations for significance outlined in Section 12.4.3.3. If these durations are not exceeded, the resulting effect during this phase of construction will be considered not significant.

12.9.1.3.2 Provision of Site Services

During the works for the provision of the site services phase, it is predicted that significant works will be taking place. There is the potential of both excavation and rock breaking during this phase for the provision services. The closest NSLs will be at distances of 10m at the boundaries of the site and nearest works. The impact during this phase at the properties closest to these construction works is likely to be temporary, negative and significant to very significant.

Other existing NSLs are at varying distances up to 25m from the site services works. Category A construction noise thresholds will be exceeded up to distances of 50 m, while Category B thresholds will be exceeded up to 25 m. All NSLs are within these distances and will experience a temporary, negative and significant to very significant effect.

12.9.1.3.3 General Construction Noise

During general construction works associated with the general construction of the residential units the activities can operate within the adopted CNT of 65 dB $L_{Aeq,T}$ at distances of ≥20m. It is not anticipated the general construction works will operate at distances within this range due to the distances from NSLs to the nearest structural works within the proposed development. The anticipated effect during this phase is therefore short term, negative and slight to moderate.

12.9.1.3.4 NSLs Within Proposed Development During Construction

During the construction of various phases of the proposed development, residential units from subsequent phases may be occupied. These units would, in turn, become the most affected NSLs as they will be closest to the construction works. Due to the phasing of the proposed project outlined within the CEMP, it is only deemed likely that NSLs within the development will be subject to the general construction noise detailed above. Where general construction occurs within 20m of residential NSLs within the proposed development, the effect will be temporary to short-term, negative, and moderate to significant, depending on the distance from the works. Where general construction occurs beyond 20 meters, the effect at residential NSLs within the proposed development will be short-term, negative, and slight to moderate.

12.9.1.4 Construction Phase – Vibration

The main potential source of vibration during the construction programme is associated with the groundbreaking activities.

During intermittent breaking activity at ground level, there is potential for vibration to be generated. Empirical data for this activity is not provided in the BS 5228-2 standard, however the likely levels of vibration from this activity is expected to be significantly below the vibration criteria for building damage based on experience from other sites. AWN Consulting have previously conducted vibration measurements under controlled conditions, during trial construction works on a sample site where concrete slab breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator
- 6 tonne hydraulic breaker on large Liebherr tracked excavator

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.48 to 0.25 PPV (mm/s) at distances of 10 to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 1.49 to 0.24 PPV (mm/s) at distances of 10 to 50m respectively. Whilst these measurements relate to a solid concrete slab, the range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity.

Vibration magnitudes associated with this activity are well below those associated with any form of cosmetic damage to buildings. There is potential for a brief, negative and moderate impact for building occupants within 20m of this activity using a 6 Tonne Breaker or equivalent. NSL groups 1,2 and 4 are all within these distances. However, this is on the conservative assumption that breaking will occur on the redline boundary. In reality any breaking works will occur at distances beyond 20m resulting in a brief, negative and not significant effect

12.9.1.5 Construction Phase – Traffic

During the construction phase, traffic associated with the proposed development would consist of a mix of Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) travelling to and from the site.

In terms of the additional construction traffic on local roads that will be generated as a result of the proposed development, the following comment is presented: As stated in the DMRB Noise and Vibration (UKHE 2020), Volume 11, Section 3, Part 7, in order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to the construction phase associated with various phases of the development will introduce a level of traffic that will not result in a significant noise impact. However, a series of mitigation measures within section 12.10 will be implemented to ensure that noise from vehicle movements during construction are reduced to a minimum.

12.9.2 Operational Phase

12.9.2.1 Mechanical Plant and Services

There are no significant sources of mechanical or electrical plant associated with the building types across the proposed development with potential to emit audible noise levels beyond the buildings themselves. (i.e., individual heat recovery systems serving the residential units where proposed). Any required plant items serving development buildings will be designed and located so that there is no negative impact on sensitive receivers within the proposed development itself.

In this instance, best practice is to set appropriate noise limits that will inform the detailed design during the selection and layout of building services for the proposed development. The operational noise level from any building services plant at the nearest residences within the proposed development will be designed/attenuated to not exceed the external noise levels discussed in Section 12.4.4.2 to ensure no negative noise impacts occur within the proposed residential units.

Once noise emissions from operational plant are designed to not exceeded the noise criteria at the new residential units within the proposed development, the related noise impact to existing NSLs offsite will be imperceptible. The overall outward noise impact of mechanical and electrical services on site to existing surrounding NSLs is determined to be neutral, imperceptible and long-term.

Existing sources of mechanical plant are present in the form of a pumping station located to the north of the proposed development. Surveys undertaken, as outlined in Section 12.6.1, indicate that the dominant noise source is the N40 road. Noise levels from the pumping station are expected to be inaudible in comparison to the anticipated road noise levels at the facades of the residential units. Therefore, any mechanical noise from the pumping station is not considered significant. Notwithstanding this, a full inward noise impact assessment is presented in Section 12.9.3. to mitigate against any effects in relation to noise sources incident on the residential development.

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12.9.2.2 Outward Noise from Creche

Measurement of noise levels generated by children playing outdoors at several crèches and kindergartens indicate typical noise levels in the order of 56 dB $L_{Aeq,1hr}$ at distance of 5 metres. Considering the usage of the creche area (e.g. external areas are only expected to be in use for a portion of the 16 hour daytime period) and the expected standard noise insulation of the façade, it is predicted that the internal criteria within Table 12-7 will be met in all residential units and the resultant noise impact due to the creche is negative, not significant and long term.

12.9.2.3 Additional Traffic on Public Roads

For the purposes of assessing the potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the proposed development, given that traffic from the development will make use of the existing road network.

Traffic flows along the surrounding road network in terms of Annual Average Daily Traffic (AADT) for the Do Minimum and Do Something scenarios have been reviewed to calculate the change in traffic noise.

The assessment years are based on the forecasted opening year of 2027 and the design year of 2042. The data for the assessed link roads and associated AADT's have been provided by the traffic consultants. Figure 12-9 outlines the road links used within the assessment whilst Table 12-14 and Table 12-15 present the increase in operational traffic noise for the years 2027 and 2042.

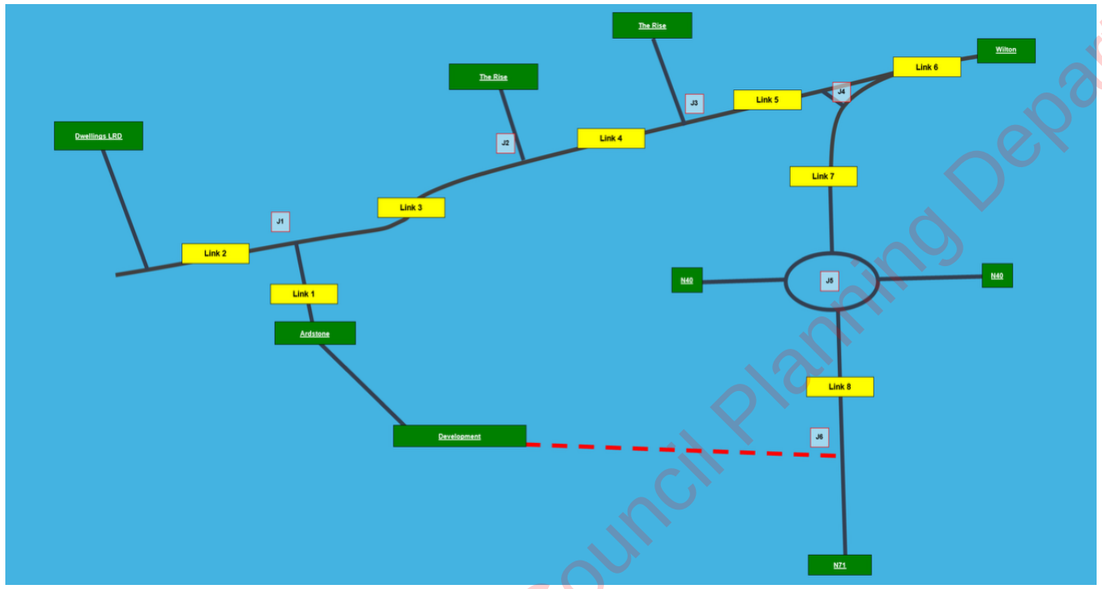


Figure 12.9 Link Roads Assessed for Operational Noise from Traffic

Table 12.14 Potential Impact in relation to Operational Phase Traffic Do Nothing v Do Something 2027

Road Link	Road Location	Do Nothing 2028		Do Something 2028		Calculated Change in Noise Levels, dB	Significance
		% HGV	AADT	%HGV	AADT		
Link 1	Development Road	2%	1,569	2%	3,620	3.6	Slight to Moderate
Link 2	Waterfall Road J1 West	2%	7,274	2%	7,577	0.2	Not Significant
Link 3	Waterfall Road J1-J2	3%	8,283	3%	10,032	0.8	Not Significant
Link 4	Waterfall Road J2 - J3	2%	7,588	2%	8,933	0.7	Not Significant
Link 5	Waterfall Road J3-J4	3%	7,846	3%	9,191	0.7	Not Significant
Link 6	Bishopstown Road J4 East	3%	15,344	3%	15,916	0.2	Not Significant
Link 7	R849 J4-J5	5%	16,320	5%	17,082	0.2	Not Significant
Link 8	N71 South J5-J6	3%	26,676	3%	26,788	0.0	Imperceptible

Table 12.15 Potential Impact in relation to Operational Phase Traffic Do Nothing v Do Something 2042

Road Link	Road Location	Do Nothing 2028		Do Something 2028		Calculated Change in Noise Levels, dB	Significance
		% HGV	AADT	%HGV	AADT		
Link 1	Development Road	2%	1,569	2%	3,620	3.6	Slight to Moderate
Link 2	Waterfall Road J1 West	2%	8,193	2%	8,496	0.2	Not Significant
Link 3	Waterfall Road J1-J2	3%	9,382	3%	11,119	0.7	Not Significant
Link 4	Waterfall Road J2 - J3	2%	8,642	2%	9,976	0.6	Not Significant
Link 5	Waterfall Road J3-J4	3%	8,933	3%	10,267	0.6	Not Significant
Link 6	Bishopstown Road J4 East	3%	17,844	3%	18,427	0.1	Not Significant
Link 7	R849 J4-J5	5%	18,942	5%	19,705	0.2	Not Significant
Link 8	N71 South J5-J6	3%	31,048	3%	31,160	0.0	Imperceptible

The resultant change in noise level associated with operational traffic from the development is calculated to be less than 1 dB(A) across both the opening and design year assessments for all road links, except for the development road at Link 1. At Link 1, the increase in traffic is expected to result in a long-term, negative effect of slight to moderate significance, based on the criteria outlined in Table 12-6. For all other road links, the change in traffic flow will lead to a long-term, negative effect that is either imperceptible or not significant.

12.9.3 Operational Phase – Inward Impact Assessment

The development lands in question are in proximity to the existing N40 national roads to the north of the proposed development. Noise from the adjacent roads and the developments position has the potential to impact the residential developments proposed for the site itself, particularly the residential units along the northern boundary bordering the N40.

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The Cork Agglomeration Noise Action Plan 2024 – 2028 states the following for the scenario where new developments are developed close to existing noise sources, e.g. new housing, hospitals, school, nursing home etc developments near to existing road, rail, industry etc:

> *"To effectively employ the planning process for consistent noise exposure avoidance or mitigation, it is deemed beneficial to incorporate guidelines on noise exposure levels during the initial proposal and design phase of planning applications"*

The following sections outlines the predicted noise exposure from the road networks and the inward impact of noise on the proposed development.

Stage 1 Noise Risk Classification of the Site

Noise levels across the proposed development have been identified through noise surveying and reference to published maps and have been categorised for both the 16 hour daytime (07:00 to 23:00hrs) $L_{Aeq,16hr}$ and the 8 hour night-time period (23:00 to 07:00hrs), $L_{Aeq,8hr}$. Giving consideration to both the measured and mapped noise levels , the initial site noise risk assessment has concluded that the level of risk across the site falls into the high noise risk category along the northern site boundary at the location of the closest residential buildings and reduces to the medium to low risk categories further south into the site.

Low Risk *At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.*

Medium Risk *As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.*

High Risk *High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice.*

Given the high-risk category along the site boundary adjacent to the N40, an Acoustic Design Strategy (ADS) will be required to demonstrate that suitable care and attention has been applied in mitigating and minimising noise impact to such an extent that an adverse noise impact will be avoided in the final development.

It should be noted that ProPG: Planning and Noise states the following with regard to how the initial site noise risk is to be used,

> *"2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design."*

Therefore, following the guidance contained in ProPG: Planning and Noise does not preclude residential development on sites that are identified as having medium risk noise levels. It merely identifies the fact that a more considered approach will be required to ensure the developments on the higher risk sites are suitable designed to mitigate the noise levels. The primary goal of the approach outlined in ProPG: Planning and Noise is to ensure that the best possible acoustic outcome is achieved for a particular site.

12.9.3.2 Stage 2 Noise Assessment

12.9.3.2.1 Noise Levels Across Development Buildings

As demonstrated in the previous section, current noise across the site are categorized as low and medium to high risk. Due to the site's position along the N40, residential properties along this road will experience the highest noise levels. The survey undertaken has been used to inform the inward impact noise assessment.

A noise model has been developed incorporating the measured noise levels and has been adapted within the following sections.

12.9.3.2.1.1 Noise Model

The proposed site layout has been modelled to determine the calculated noise levels at the facades of the development building taking account of the proposed site ground levels and screening from existing barriers and buildings across the site.

The model was calibrated against the measured noise levels outlined within section 12.6. Table 12-16 compares the average measured survey noise levels where there was no recorded rainfall for both the day and nighttime periods against the calibrated noise levels.

Table 12.16 Measured Noise Levels vs Calibrated Noise Levels

Position	Measured Noise Levels Day Time $L_{Aeq,16\ hour}$	Calibration Noise Model Day Time $L_{Aeq,16\ hour}$	Measured Noise Levels Night Time $L_{Aeq,8\ hour}$	Calibration Noise Model Night Time $L_{Aeq,8\ hour}$
UN1	76	77	68	69

The calibration model shows good agreement between the measured and calibrated noise levels and the results of the noise model across the development site are further explored within Section 12.9.3.3.

12.9.3.2.2 Element 1 – Good Acoustic Design Process

In practice, good acoustic design should deliver the optimum acoustic design for a particular site without adversely affecting residential amenity or the quality of life of occupants or compromising other sustainable design objectives. Section 2.23 of the ProPG: Planning and Noise outlines the following checklist for Good Acoustic Design:

- Check the feasibility of relocating or reducing noise levels from relevant sources;
- Consider options for planning the site or building layout;
- Consider the orientation of proposed building(s);
- Select construction types and methods for meeting building performance requirements;

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- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc;
- Assess the viability of alternative solutions; and,
- Assess external amenity area noise.

In the context of the proposed development, each of the considerations listed above have been addressed in the following subsections.

12.9.3.2.2.1 Relocation or Reduction of Noise from Source

Noise sources incident upon the development site have been determined to be high risk along the northern boundary of the site bordering the N40. Control of noise at source from road traffic is outside of the site boundary and hence is outside of the scope of the proposed development.

12.9.3.2.2.2 Planning, Layout and Orientation

Consideration has been given to the location of both the buildings and external amenity areas. In the first instance, a primary consideration was to ensure that residential buildings are located as far as possible from the busy roads. Where this cannot be accommodated along the northern section (e.g. apartments and houses facing the N40) a review for the need of additional façade noise attenuation measures will be incorporated into the design.

The orientation of the site is such that the residential buildings themselves screen the rear private gardens for the majority of units and also many of the common external amenity areas associated with the development.

The higher buildings consisting of apartments units are set along the northern boundary. There is a benefit of locating the higher buildings closer to the sources of road traffic as they act as a physical screen and act as mitigation against road noise for both some of the other units within the development and some of the external amenity areas within the development.

12.9.3.2.2.3 Select Construction Types for meeting Building Regulations

The design of all buildings is required to meet with all relevant parts of the Building Regulations. The specific detail of which will be completed at detailed design stage. In terms of the building sound insulation, the glazed elements and any required ventilation paths to achieve compliance with Part F of the Building Regulations will be the weakest elements in the façade.

Consideration will therefore be given to the provision of sound insulation performance for glazing and ventilation systems, where required to achieve suitable internal noise levels within the development. This is specified within section 12.9.3.3 below. Achievement of acceptable internal ambient noise levels does not form part of building regulation requirements. However, this will be incorporated into the building design in line with best practice and compliance with the guidance set out in ProPG: Planning and Noise.

12.9.3.2.2.4 Impact of Noise Control Measures on fire, health and safety

The good acoustic design measures that have been implemented on site, e.g., locating properties away from the road where feasible are considered to be cost neutral and do not have any significant impact on other issues.

12.9.3.2.2.6 Assess Viability of Alternative Solutions

Due to the two-storey height of the proposed buildings and their proximity to the N40, it is considered that specific boundary treatment along the southern boundary of the site to attenuate traffic noise could be effective in part and will be explored further as part of the detailed design of the development.

12.9.3.2.2.6 Assess External Amenity Area Noise

ProPG: Planning and Noise provides the following advice with regards to external noise levels for amenity areas in the development:

> *"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."*

Noise levels across external amenity areas associated with the development are presented in Section 12.9.3.4 of this report.

12.9.3.2.2.7 Summary

Considering the constraints of the site, insofar as possible and without limiting the extent of the development area, the principles of Good Acoustic Design have been applied to the development.

12.9.3.3 Element 2 – Internal Noise Levels

Element 2 of the ProPG: Planning and Noise document sets out recommended internal noise targets derived from BS 8233 (2014). The recommended indoor ambient noise levels are set out in Table 12-8 and are based on annual average data.

ProPG: Planning and Noise and BS 8233 notes that where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

ProPG: Planning and Noise specifically noted that the more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally.

In terms of the ventilation strategy, it is understood that the air supply will be via mechanical ventilation (MVHR) which typically ducted above internal ceilings hence provide a sound insulation performance substantially improved over passive in-frame or wall vents.

In order to assess the requirements for achievement of acceptable internal noise levels, appropriate specifications to the site boundary treatment should be considered along with appropriate acoustic specifications to windows and mechanical vents will be provided to ensure the rooms are adequately ventilated and achieve the good internal noise levels detailed here.

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12.9.3.3.1 Façade Noise Levels

As shown within section 12.9.3.2.1.1 agreement between the calibrated noise model and measured noise levels was achieved. Once calibration was achieved the noise model was developed to calculate the noise levels at the development taking account the proposed site layout. The day and night periods have been modelled to determine the calculated noise levels at the facades of the proposed development buildings. Figure 12-10 and Figure 12-11 present the noise contours across the proposed development for the day and night-time periods. The daytime period relates to the 16-hour period between 07:00 and 23:00 whilst the nighttime period relates to the 8-hour period between 23:00 and 07:00. These periods are referenced within the adopted guidance of ProPG: Planning and Noise and BS 8233 and are used to assess the impact of noise across the proposed development.

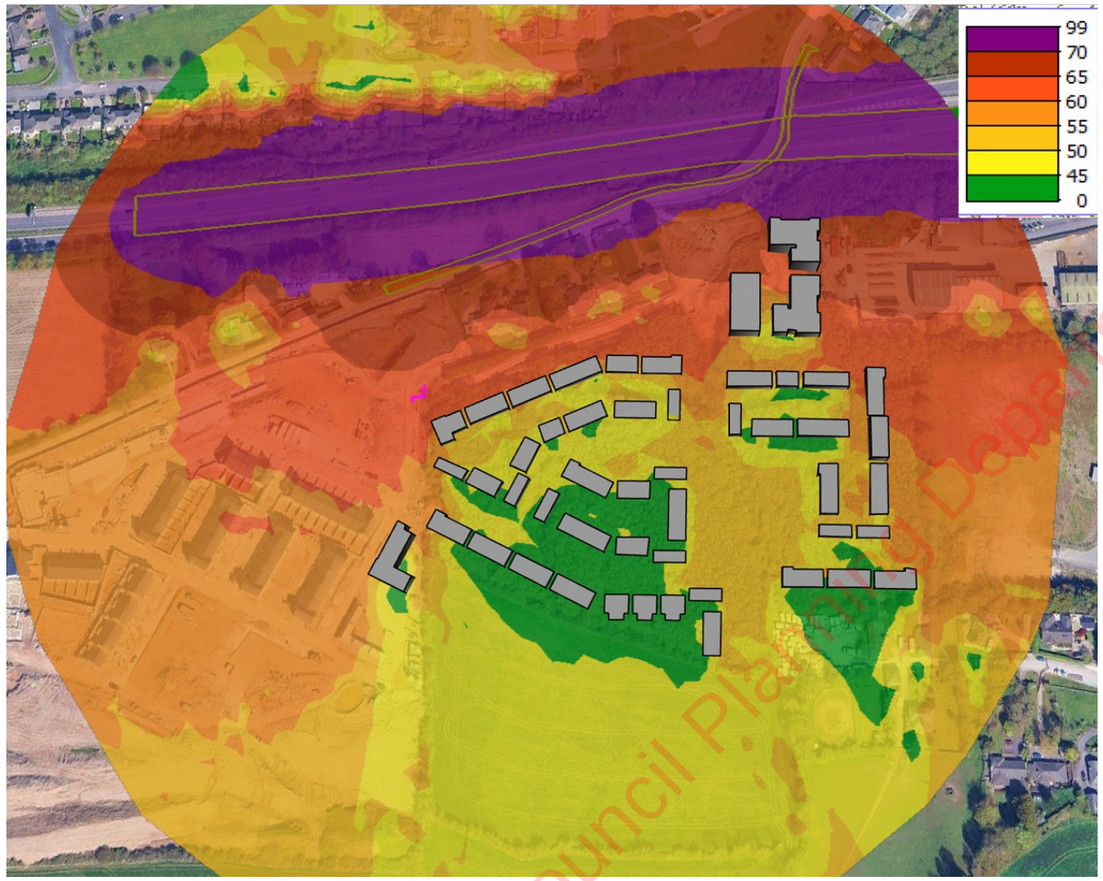


Figure 12.10 Noise Model Daytime $L_{Aeq, 16\ hour}$ noise levels across the development

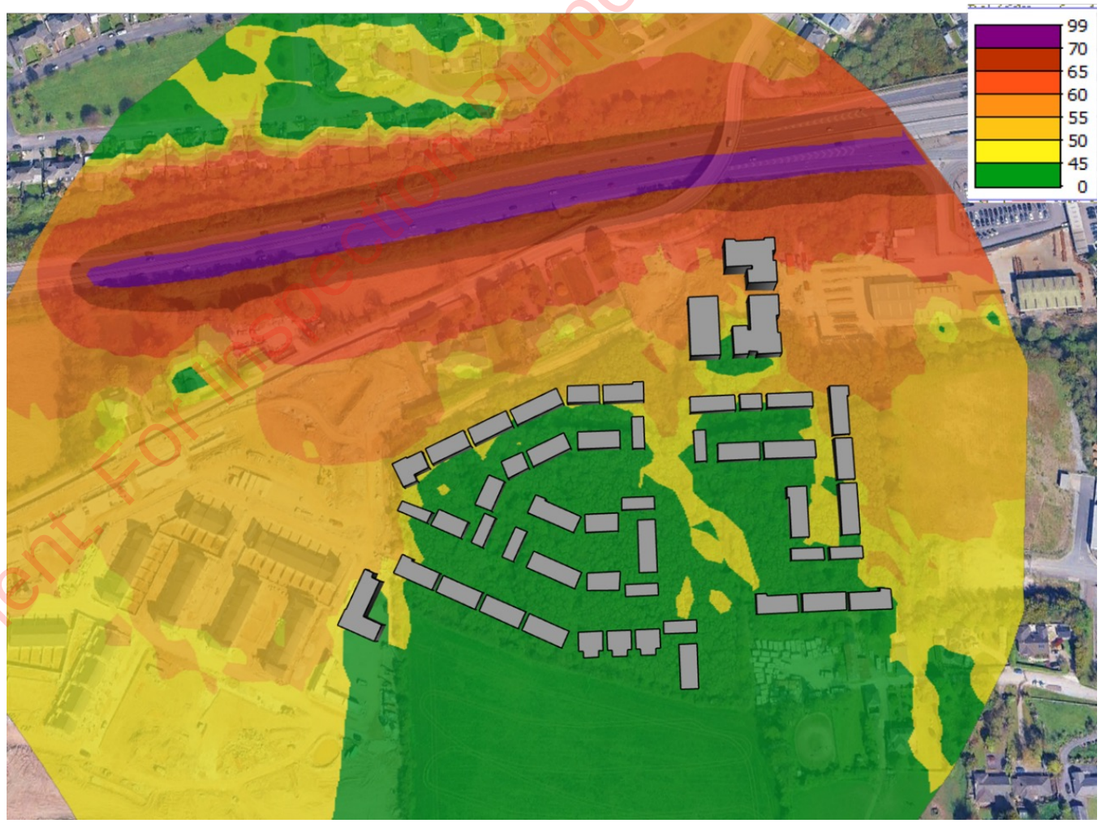


Figure 12.11 Noise Model Nighttime $L_{Aeq, 8\ hour}$ noise levels across the development

The noise model indicates that the noise levels across the northern façades at the apartment blocks facing the N40 during the 16-hour daytime period range from 65 dB $L_{Aeq,16\ hour}$ to 72 dB $L_{Aeq, 16\ hour.}$ Slightly lower levels of noise will be experienced at the facades of the houses to the north east of the site facing onto the N40 which will experience noise levels within the range of 62 to 63 dB $L_{Aeq,16hour.}$ Other dwellings further into the proposed development will experience lower levels of noise due to the distance increasing from the N40 and the benefit offered by screening from both the apartment blocks and existing buildings along waterfall road.

During the nighttime period the levels of noise predicted at northern facades at the apartment blocks along the N40 are predicted to be within the region of 60 – 64 dB $L_{Aeq, 8\ hour}$, with facades along the houses to the northeast facing the road experiencing noise levels within the region of 54 -55 dB $L_{Aeq, 8\ hour.}$

Considering the measured and predicted high external noise levels across various facades within the proposed development, it will be necessary to use appropriate facade elements to meet the recommended internal noise levels. This will be critical along the facades facing onto the N40.

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12.9.3.3.2 Proposed Façade Treatment

The British Standard BS EN 12354-3 provides a calculation methodology for determining the sound insulation performance of the external envelope of a building. The method is based on an elemental analysis of the building envelope and can take into account both the direct and flanking transmission paths.

The Standard allows the acoustic performance of the building to be assessed taking into account the following:

- Construction type of each element (i.e. windows, walls, etc.);
- Area of each element;
- Shape of the façade, and;
- Characteristics of the receiving room.

12.9.3.3.2.1 Glazing

The principals outlined in BS EN 12354-3 are also referred to in BS 8233 and Annex G of BS 8233 which provides a calculation method to determine the internal noise level within a building using the composite sound insulation performance calculated using the methods outlined in BS EN 12354-3. The methodology outlined in Annex G of BS 8233 has been adopted here to determine the required performance of the building facades.

As is the case in most buildings, the glazed elements of the building envelope are typically the weakest element from a sound insulation perspective. In this instance all identified facades will be provided with glazing that, when closed, achieve the minimum sound insulation performance as set out in 12-17. All facades that require upgraded glazing are identified within Figure 12-12.

In this instance it has been calculated that the various facades are to be provided with glazing that, when closed, achieves the recommended internal noise criteria. The specifications provided in Table 12-17 are indicative and may be developed further during the detailed design stage. Alternative specifications will be acceptable provided the internal ambient noise criteria outlined in Table 12-7 can be achieved.

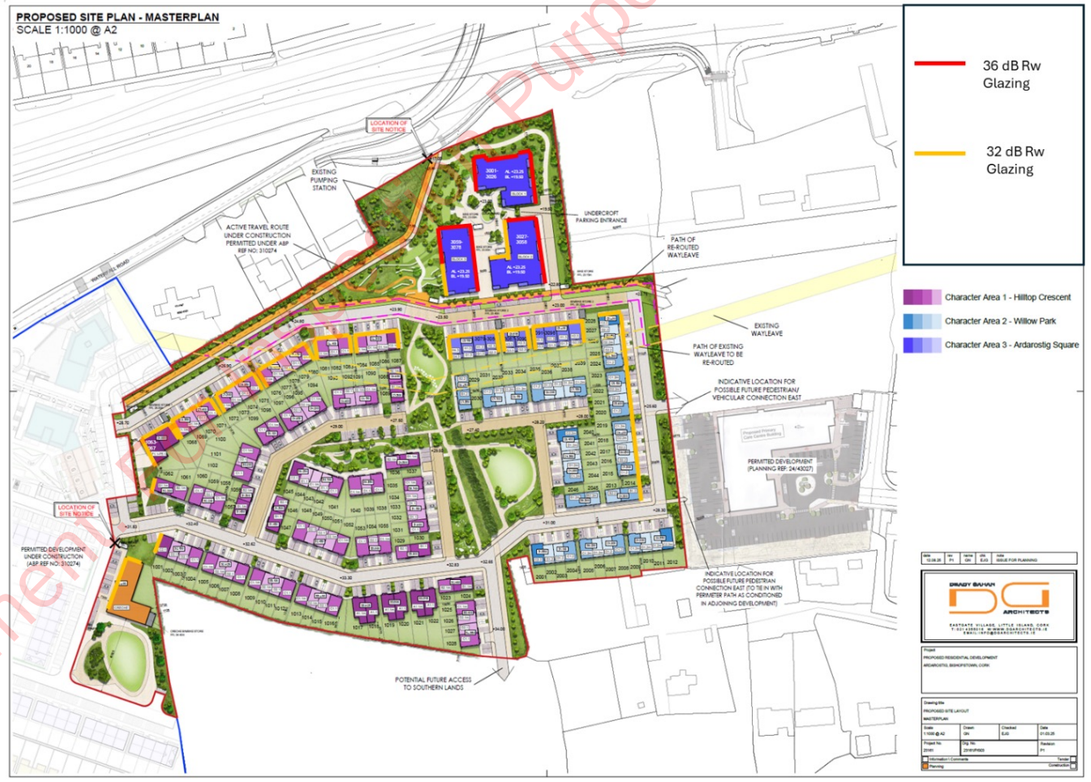


Figure 12.12 Identified Facades for Upgraded Glazing

Table 12.17 Indicative Sound Insulation Performance Requirements for Glazing SRI (dB)

Glazing Specification	Octave Band Centre Frequency (Hz)						dB Rw
	125	250	500	1k	2k	4k	
Facades Marked in Red	25	22	33	40	43	44	36
Facades Marked in Orange	20	19	29	38	36	45	32
All other Facades (unmarked)	22	17	26	36	40	43	30

12.9.3.3.2.2 Wall Construction

In general, all wall constructions (i.e. block work, concrete and timber frame) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 50 dB R_w for this construction.

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12.9.3.3.2.3 Ventilation

Whilst the ventilation strategy for the development has been progressed, the final ventilation strategy will be in accordance with Part F of the Building Regulations and will be finalised at the detailed design stage.

It is understood that the ventilation strategy for the residential units will be mechanical, utilising independent ventilation fans within each apartment. Therefore, a minimum $D_{n,e,w}$ (element normalised level difference) is not provided for vents serving the proposed residential units. Should the ventilation strategy change, a minimum specification will need to be explored at the detailed design stage to minimise the effects of intrusive noise.

Any penetrations in the façade to facilitate the mechanical ventilation strategy will be suitably designed at the detailed design stage so as not to compromise the overall sound insulation performance of the façade.

12.9.3.3.2.4 Internal Noise Levels

Considering the facade treatment outlined within section 12.9.3.3.2 the external façade levels and the specified building envelopes, the internal noise levels have been calculated. In all instances the good internal noise criteria are achieved for daytime and night-time periods with the identified glazing in a closed window scenario.

12.9.3.4 Element 3 – External Amenity Area Noise Assessment

Figure 12-13 presents the calculated day time noise levels across the site with the development buildings in place. The contours are calculated for a height of 1.5m.

External noise levels within the majority of the communal open spaces to the rear of the development site are within the recommended range of noise levels from ProPG of between 50 – 55 dB $L_{Aeq,16hr}$. The amenity areas on the balconies and courtyard areas within the apartment areas facing onto the N40 are however above the recommended noise levels for amenity spaces. The closest private rear gardens of the dwellings located to the northeast of the site are also slightly above the 55 dB $L_{Aeq,16hr}$ for amenity areas outlined within ProPG. However, this is offset by the number of alternative amenity areas within the proposed development where the criteria is achieved.

For the majority of the site, It is considered that the objectives of achieving suitable external noise levels is achieved. Mitigation in the form of noise barriers could be explored at the detailed design stage to mitigate noise levels within private amenity spaces to the northeast of the proposed development.

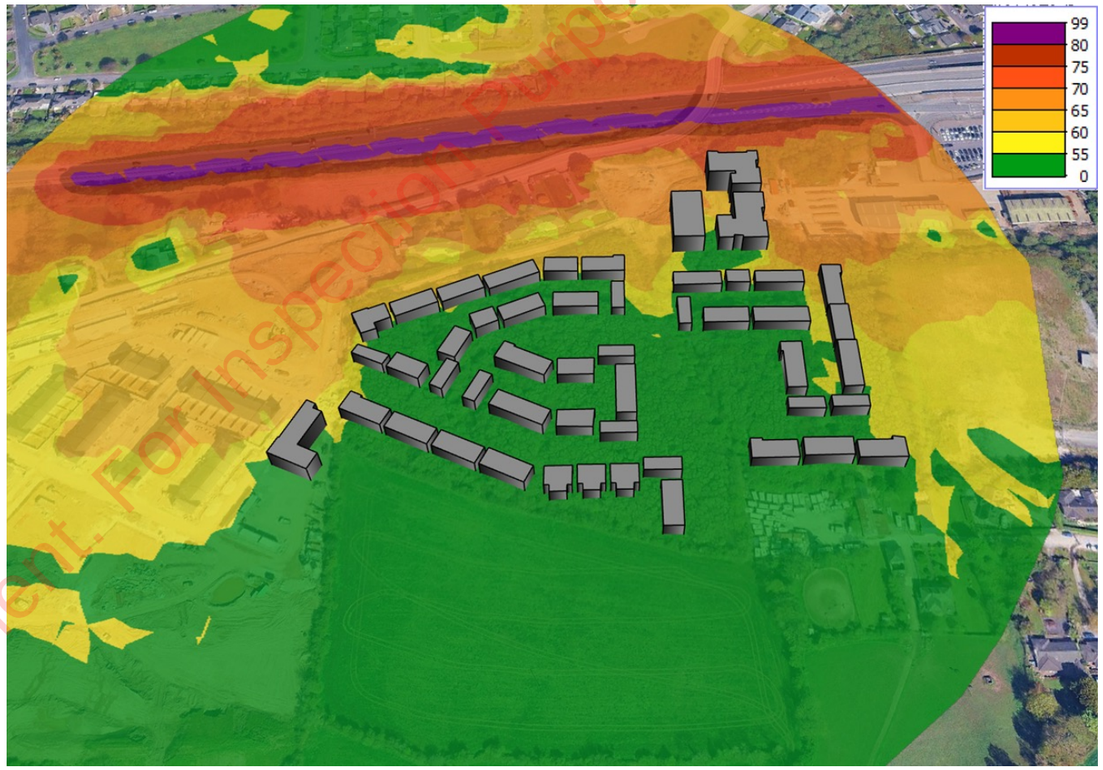


Figure 12.13 External Amenity Daytime Noise Levels Across the Proposed Development Site (1.5m Contours)

12.9.3.5 Element 4 – Assessment of Other Relevant Issues

Element 4 gives consideration to other factors that may prove pertinent to the assessment, these are defined in the document as:

- 4(i) compliance with relevant national and local policy;
- 4(ii) magnitude and extent of compliance with ProPG;
- 4(iii) likely occupants of the development;
- 4(iv) acoustic design v unintended adverse consequences; and
- 4(v) acoustic design v wider planning objectives.

Each is discussed in turn below.

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12.9.3.5.1 Compliance with Relevant National and Local Policy

There are no National policy documents relating to the acoustic design of residential dwellings. Locally the Cork Agglomeration Noise Action Plan 2024 – 2028 specifies that the guidance contained within ProPG should be used in assessing the noise impact on new residential developments.

This Acoustic Design Statement has been prepared in compliance with the requirements of ProPG and therefore complies with the requirements of local policy.

12.9.3.5.2 Magnitude and Extent of Compliance with ProPG

As discussed within this report, the following conclusion has been drawn with regards to the extent of compliance with ProPG:

- All dwellings as part of the development have been designed to achieve the good level of internal noise levels specified within ProPG. The apartment units at the northern boundary of the site, overlooking the N40 and the two storey houses at the north east and north west of the sit that have living rooms and bedrooms facing onto the local road networks will require closed windows to achieve this level i.e. at the closest facades facing onto the dominant N40 road external to the site.
- External amenity areas have been assessed and calculated. For the most part they comply with the recommended criterion set out in ProPG. Areas where they do not have been identified within section 12.9.3.4 and are offset by open areas within the development that do comply with the recommended criterion for external amenity areas.

Based on the preceding, it is concluded that the proposed development is largely in compliance with the requirements of ProPG.

12.9.3.5.3 Likely Occupants of the Development

The criteria adopted as part of this assessment are based on those recommended for permanent dwellings, therefore the adopted criteria is considered robust and appropriate for the likely occupants.

12.9.3.5.4 Acoustic Design v Unintended Adverse Consequences

Unintended adverse consequences did not occur on this project.

12.9.3.5.5 Acoustic Design v Wider Planning Objectives

There are no wider planning objectives that affect the acoustic design that are apparent at the time of writing.

12.9.3.6 Acoustic Design Statement Conclusion

An initial site noise risk assessment has been carried out in respect of the proposed development. The assessment has classified the site as having 'low to high' noise risk. This was determined through on-site noise monitoring and reference to available noise maps.

Further discussion is presented in terms of the likely noise impact of both the external and internal areas of the proposed development. It is necessary to provide enhanced acoustic glazing at the specified facades within Figure 12-12 to ensure that, when windows are closed, the internal noise environment is good. The noise level internally with the windows open will be higher than ideal at the at the units within the site that are overlooking the N40. However, inhabitants will have the option to close the window to reduce the noise level internally with mechanical ventilation.

12.9.3.7 Comment on Inward Noise Impact from existing Steel Yard and Pumping Station

Other noise sources incident upon the proposed development includes the existing pumping station located to the north, and Heiton Steel situated to the northeast.

The baseline acoustic environment is described in section 12.6. Baseline noise surveys identified the N40 and Waterfall Road, both to the north of the development, as the dominant noise sources.

Measurements taken at monitoring position UN1 include contributions from both Heiton Steel and the pumping station, provided that both facilities were operating under normal conditions at the time of the survey.

The inward noise impact assessment and the glazing specification detailed in Table 12-17 are based on the calibrated noise spectrum measured at position UN1. Accordingly, it is considered that the specified glazing will also provide adequate protection to internal residential amenity from other identified noise sources located to the north of the development.

12.9.4 Cumulative Effects

12.9.4.1 Construction Phase

In the event that construction activities at the nearby sites are taking place concurrently with the construction of the proposed development, there is potential for cumulative noise impacts to occur. Due to the nature of construction works associated with the proposed development, noise levels from this site will dominate the noise environment when occurring in proximity to the noise sensitive locations along its immediate boundary. The noise contribution from other construction sites would need be equal to those associated with the proposed development in order to result in any cumulative effect.

In the event of the two construction phases of the proposed development overlapping predicted construction noise levels within Section 12.9.1 may rise by the order of +3 dB.

12.9.4.2 Operational Phase

The noise limits set for on-site buildings are designed to avoid any significant increase in the prevailing background noise environment external to the site. Operational noise limits included in this report refer to cumulative noise from all fixed installations on site. The design of plant and other fixed installations will be progressed during the design stage to ensure the noise limits at off-site noise sensitive locations are not exceeded.

Traffic volumes assessed take account of the additional traffic from other permitted developments and therefore the traffic noise assessment presented is already assessing the cumulative impact. This assessment has concluded there will be no significant noise impact due to operational traffic.

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12.9.5 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 12.18 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Site Set up and Clearance	Negative	Significant to Very Significant	Potential effect during site set up and clearance significant to very significant at nearest NSLs however works will likely be at varying distances. Beyond 100m from works the effects will reduce to slight to moderate.	Likely	Brief to Temporary	Direct
Provision of Site Services Noise	Negative	Slight to Moderate to Very Significant	Significant to Very Significant at nearest NSLs to works. Category A thresholds will be exceeded up to 50m and Category B thresholds exceeded up to 25m.	Likely	Temporary	Direct
General Construction Noise	Negative	Slight to Moderate	Slight to Moderate beyond 20m. General Construction works not anticipated to take place at distances below this.	Likely	Short- Term	Direct
Construction Phase Vibration	Negative	Moderate to Not Significant	Moderate at NSLs within 20m of breaking, Not Significant beyond this distance	Unlikely dependent on distance	Brief	Direct
Construction Phase Traffic	Negative	Not Significant	Not significant at all NSLs.	Likely	Short- Term	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 12.19 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Mechanical Plant and Services	Negative	Imperceptible	Imperceptible as long as operational plant are designed to not exceeded the noise criteria	Likely	Long Term	Direct
Outward Noise from Creche	Negative	Not Significant	Not Significant at NSLs within and outside of development	Likely	Long Term	Direct
Additional Traffic on Public Roads	Negative	Imperceptible to Moderate	Imperceptible to Not Significant at all road links other than the development road where a slight to moderate effect will occur in relation to operational traffic noise.	Likely	Long Term	Direct
Inward Impact Assessment	Neutral	Not Significant	Full Acoustic Design Statement within Section 12.9.3 . Mitigation to be supplied in the form of upgraded glazing to achieve suitable internal noise levels.	Likely	Long Term	Direct

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12.10 Mitigation Measures

12.10.1 Construction Phase Mitigation

The assessment detailed in Section 12.9.1 has determined that construction activities can operate within the adopted construction noise threshold levels at NSLs 100m and beyond for the site set up, clearance and demolition phase of works, 50m for the provision of the internal road and site services phase and 20m and beyond for the general construction phase of the proposed development. At NSLs situated close to the site there is potential for the CNT to be exceeded during the site set up and site services phases.

Vibration levels at the neighbouring buildings beyond 20m are expected to be orders of magnitude below the limits set out in Table 12-3 to avoid any cosmetic damage to buildings.

A suite of noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid exceedance of the adopted construction noise threshold values at the nearest NSLs. The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- Selection of quiet plant;
- Noise control at source;
- Screening, and;
- Liaison with the Public

Further comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, hours of work and noise monitoring, where required.

12.10.1.1 Selection of Quiet Plant

The potential for any item of plant to result in exceedance of construction noise thresholds will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever practicable (e.g., plant items with sound attenuation incorporated). Should a particular item of plant already on the site be found to exceed the construction noise thresholds, the first action will be to identify whether the item can be replaced with a quieter alternative.

The appointed contractor will evaluate the choice of excavation, breaking, piling or other working methods taking into account various ground conditions and site constraints. Where alternative lower noise generating equipment are available that will provide equivalent structural / excavation results, these will be selected to control noise within the relevant thresholds, where it is practicable to do so.

12.10.1.2 Noise Control at Source

The following measures will be implemented, by the appointed contractor to control noise at source. These measures relate to specific site considerations:

- For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilising an acoustic canopy to replace the normal engine cover and / or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant will be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed;
- Where compressors, generators and pumps are located in proximity to NSLs and have the potential to exceed the construction noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation; and
- Resonance effects in panel work or cover plates can be reduced through stiffening or the application of damping compounds, while other noise nuisance can be controlled by fixing resilient materials in between the surfaces in contact.

For all materials handling, ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.

12.10.1.3 Screening

Screening is an effective method of reducing CNLs at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver. Standard construction site hoarding (2.4 m in height) with a mass per unit of surface area greater than 7 kg/m^2 can provide adequate sound insulation. This is recommended, as a minimum around all site boundaries of the proposed development site.

Erection of localised demountable enclosures or screens will be used around particularly noisy equipment as required, when in operation in proximity to NSLs with the potential to exceed the construction noise thresholds. Annex B of BS 5228–1 (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on-site from standard materials. A well placed and designed mobile temporary screen around a pile, breaker or excavation can effectively reduce noise emissions by 10 dB(A).

In addition, careful planning of the construction site layout will also be considered. The placement of site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening.

12.10.1.4 Hours of Work

Working hours will be restricted to 07:00 to 19:00 Monday to Friday & 08:00 to 16:00 on Saturdays. Sunday or Bank Holiday work will only take place periodically at the agreement with Cork City Council. Similarly, any other out of hours working will be only permitted by arrangement with site management and Cork City Council.

12.10.1.5 Liaison with the public

A designated Community Liaison Officer (CLO) will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the CLO. In addition, prior to particularly noisy construction activity, the CLO will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

12.10.1.6 Monitoring

During the construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017).

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12.10.1.7 Vibration Control

Vibration from construction activities will be limited to the values set out in Table 12-3 to avoid any form of potential cosmetic damage to buildings and structures. Monitoring will be undertaken at sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values in Table 12-3. This will be at NSLs within 20m of any proposed rock breaking.

12.10.2 Operational Phase Mitigation

12.10.2.1 Traffic Along Surrounding Road Network

Changes to traffic flows will result in a moderate to not significant increase in noise level in the surrounding environment. Therefore, no mitigation measures are necessary in this case.

12.10.2.2 Building Services Noise

With consideration at the detailed design stage, the selection and location of plant items within the proposed development and associated buildings will ensure that noise emissions from any mechanical and electrical building services plant do not exceed the relevant noise criteria within Section 12.4.4, therefore no further mitigation is required. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements.

Once operational noise emissions are controlled within the development site, there will be no perceptible noise impact at sensitive receivers off-site.

12.10.2.3 Creche Noise

As outlined within section 12.9.2.2 noise related to the proposed creche will result in a not significant effect. Notwithstanding this the operation of the creche will be limited to within the daytime hours and not cause noise nuisance that exceeds the internal noise criteria presented within Section 12.4.4.

12.10.2.4 Inward Impact

Mitigation against inward noise from the N40k road is listed by the way of enhanced glazing treatments at the specified facades within Figure 12-12. Suitable sound insulation requirements for glazing are given within Table 12-17. Notwithstanding this, as part of the detailed design of all residential blocks, the specifics in terms of octave band SRI performances will be reanalysed to take account of the finalised boundary treatment, ventilation strategies, room layouts, room volumes and glazing dimensions.

12.11 Residual Impact Assessment

12.11.1 Construction Phase

The use of best practice noise control measures, hours of operation, scheduling of works within appropriate time periods, and noise monitoring during this phase will be implemented. With the inclusion of the various noise and vibration control measures on site discussed in Section 12.10.1, it is expected that calculated noise levels in Table 12-13 can be reduced by 5 dB. Table 12-21 presents the construction noise levels after the implementation of mitigation.

Table 12.20 Indicative Construction Noise Levels at Varying Distances

Construction Phase	Cumulative Sound Pressure, dB $L_{Aeq,T}$ at 10m	Calculated Noise Levels at Varying Distances, dB $L_{Aeq,T}$							
		10m	15m	20m	25m	50m	70m	90m	100m
Site Set Up and Clearance	**92**	80	76	74	72	66	63	61	60
Provision of Site Services	**85**	73	69	67	65	59	56	54	53
General Construction	**78**	66	62	60	58	52	49	47	46

After the implementation of mitigation measures, residual construction noise levels at the closest NSLs within 15m are still expected to be in the region of up to 10 dB above the category A CNT of 65 dB $L_{Aeq,T}$ and 6 dB above the category B CNT of 70 dB $L_{Aeq,T}$ during the site set up, clearance phase of works. This will affect the nearest identified NSLs at the boundaries of the site during this phase for intermittent periods. Referring to Table 12-2 there is a potential for a residual brief to temporary, negative, significant to very significant impact at these NSLs during the site set up and clearance and preparation phase. This will reduce to a temporary, negative, moderate to significant effect at distances beyond 30m and temporary, negative and slight to moderate beyond 60m. With reference to section 12.9.1.2.1 should the site setup and clearance phase not exceed the durations of significance within 12.4.3.3 then the overall residual effect during this phase of construction may fall to not significant.

During provision of the site services phase of the proposed development, the NSLs closest to the construction boundary are at distances where, after the implementation of mitigation measures, it is expected that construction noise levels will still exceed the adopted category B CNT at distances of up to 15m and the category A CNT up to 25m. At NSLs within 25 m a short term, negative and moderate to significant residual impact is predicted, reducing to slight to moderate at all distances beyond 25m.

During general construction phase of the proposed development, it is expected that construction noise levels will fall within the adopted CNT at distances beyond 10m. All NSLs are likely to experience a short term, negative and slight to moderate effect during the general construction phase of the proposed development.

It is important to note that construction activities are inherently transient, meaning noise intrusive works will only affect the nearest NSLs for brief periods. The construction noise calculations are highly conservative, representing a worst-case scenario. In practice, it is likely that the actual noise levels and associated residual impacts will be lower than predicted.

The likely residual effect of construction vibration is short term, negative, and moderate where rock breaking occurs within 20m of NSLs and short term, negative, and not significant at all NSLs beyond these distances.

12.11.2 Operational Phase

Noise levels from any building services plant within the development site will be controlled to not exceed the noise levels outlined within section 12.4.4.

Once operational noise emissions are controlled within the development site, noise emissions outside the site will be imperceptible. The residual noise effect is neutral, Imperceptible and long Term.

Traffic along the surrounding road network will not lead to a change in noise level that would pose any significant effect. The resultant impact is long-term, negative and imperceptible to not significant along all link roads other than the development road where a long-term, negative and slight tom moderate effect will occur.

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12.11.3 Operational Phase – Inward Impact

Noise levels inwards on the proposed development have been measured, calculated and assessed. Mitigation measures in the way of enhanced glazing have been specified to ensure that good internal noise levels can be achieved across the proposed development. The resultant residual noise impact at residents within the development will be negative, not significant and long term.

12.11.4 Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 12.21 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Site Set Up and Clearance Noise	Negative	Significant to Very Significant	Category A CNT exceeded up to 60m whilst Category B exceeded up to 30m. Significance will depend on distance to NSL with the significance reducing with distance from the works.	Likely	Brief to Temporary	Residual
Provision of Site Services Noise	Negative	Slight to Moderate to Very Significant	Significant to Very Significant within 10m of NSLs, Moderate to Significant between 10 and 25m and Slight to Moderate beyond 25m.	Likely	Temporary	Residual
General Construction Noise	Negative	Slight to Moderate	Slight to Moderate beyond 10m.	Likely	Short- Term	Residual
Construction Phase Vibration	Negative	Not Significant	Not Significant once mitigation implemented at NSLs beyond 20m	Unlikely dependent on distance	Brief	Residual
Construction Phase Traffic	Negative	Not Significant	Not significant at all NSLs.	Likely	Short- Term	Residual

The following Table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 12.22 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Mechanical Plant and Services	Negative	Not Significant	Not Significant as long as operational plant is designed to not exceeded the noise criteria	Likely	Long Term	Residual
Additional Traffic on Public Roads	Negative	Imperceptible to Moderate	Imperceptible to Not Significant on all Road Links other than development road where a slight to moderate effect occurs.	Likely	Long Term	Residual
Outward Noise from Creche	Negative	Not Significant	Not Significant at NSLs within and outside of development	Likely	Long Term	Residual
Inward Impact Assessment	Neutral	Not Significant	Full Acoustic Design Statement within Section 12.9.3. Mitigation to be supplied in the form enhanced glazing to achieve internal noise criteria.	Likely	Long Term	Residual

12.11.5 Cumulative Residual Effects

There is potential for a temporary increase in cumulative construction noise if multiple phases or other developments occur at the same time. Residual cumulative effects related to the construction phase, post-mitigation, are likely to be not significant. This is also true for the operational phase, provided that the operational noise levels outlined in 12.9.2.1. are adhered to during the detailed design, and the mitigation measures specified in section 12.10 are followed.

12.12 Risk of Major Accidents or Disasters

The assessment of noise and vibration during both the construction and operational phases of the project has been conducted in accordance with relevant regulations and guidelines.

During the construction phase, the primary risks associated with noise and vibration include equipment failure, which can lead to unexpected high noise levels and potential disturbances or harm to nearby residents and workers, and accidental spills or explosions, which can result in sudden, high-intensity noise and vibration, posing risks to human health and structural integrity. Mitigation measures outlined within section 12.10.1 decrease the chances of these events taking place.

In the operational phase, the risks are generally lower but still present, such as operational malfunctions, where failures in noise control systems or unexpected operational changes can lead to increased noise levels. Mitigation strategies involve monitoring, adherence to operational noise limits as specified in section 12.4.4.2 12.4.4, and implementation of the mitigation measures outlined in section 12.10.2

Overall, with the application of these mitigation measures, the risk of major accidents or disasters resulting in significant noise and vibration impacts is considered to be low.

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12.13 Interactions

The potential interaction between noise and vibration and other specialist chapters in the EIAR is primarily limited to Population & Human Health, Traffic & Transport and Biodiversity. This chapter has been prepared in consideration of and in conjunction with the relevant elements of these chapters. For example, noise and vibration impacts associated with the Proposed Development have been fully considered within this Chapter of the EIA Report. The traffic flow projections associated with the development provided by the traffic consultants has been utilised in the operational section in this Chapter of the EIAR report.

12.14 Monitoring

12.14.1 Construction Phase

During the demolition/construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017).

12.14.2 Operational Phase

There are no proposed monitoring requirements associated with the operational phase of the proposed Development.

12.15 Conclusion

In conclusion, an assessment of noise and vibration impacts associated with the proposed residential development at Ardarostig, Bishopstown, Cork has been conducted for both the construction and operational phases. Reference has been made to the most up-to-date and relevant standards and guidance, and all findings have been compiled within this EIAR chapter.

A baseline noise survey was carried out to determine the prevailing noise environment and to inform the impact assessment.

During the construction phase, noise and vibration levels are expected to be elevated due to activities such as site clearance, excavation, and the use of heavy machinery. Mitigation measures, as outlined in section 12.10, will be implemented across the site and at locations where significant effects have been identified. Despite these measures, some short-term, moderate to very significant impacts are anticipated at NSLs closest to the construction works.

In the operational phase, the primary sources of noise will be traffic associated with the development and any mechanical plant introduced as part of the scheme. Predicted noise levels are expected to fall within the adopted noise limits, as defined by relevant standards and guidelines.

A full Inward Impact Assessment and Acoustic Design Statement has been prepared as part of this EIAR. It outlines predicted noise levels across the proposed development in relation to nearby road networks, including the N40 to the north of the development. Mitigation measures, including enhanced glazing, have been identified. With these in place, good internal noise levels are expected throughout the development.

External amenity areas have also been assessed and are predicted to fall within the recommended noise level range set out in ProPG for the majority of the site. In some private amenity areas where noise levels are expected to slightly exceed the recommended thresholds, several alternative amenity spaces within the development meet the adopted criteria. Therefore, it is considered that the objective of achieving suitable external noise levels has been met.

Vibration associated with the construction proposed development is anticipated to be not significant beyond 20m whilst there are no associated sources of vibration within the operational phase of the proposed development.

12.16 References and Sources

- ANC, IOA & CIEH (2017). ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise – New Residential Development.
- British Standard Institute (BSI) British Standard (BS) 5228-1:2009 +A1 2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (BSI 2014b);
- BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (hereafter referred to as BS 7385–2). (BSI 1993);
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (BSI 2008);
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (BSI 2019);
- Cork Agglomeration Noise Action Plan 2024-2028.
- EPA (2022). Guidelines on the Information to be contained in Environmental Impact Assessment Reports.
- UK Highways England (UKHE) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (UKHE 2020);
- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- International Organization for Standardization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (ISO 1996);
- ISO 1996-1: 2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (ISO 2016);
- ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (ISO 2017),

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CHAPTER THIRTEEN

AIR QUALITY

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CHAPTER THIRTEEN

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CHAPTER 13 | Air Quality

13.1 Introduction

This chapter assesses the likely air quality impacts associated with the proposed Bridgewater largescale residential development situated southwest of Cork City, at Ardarostig, Bishopstown, Cork. This report assesses the baseline air quality conditions at the site and evaluates the potential effects of the proposed development's construction and operation. Where required, appropriate mitigation measures to limit any identified likely significant adverse impacts to air quality are recommended.

A full description of the development is available in Chapter 2. This Chapter should be read in conjunction with Chapter 6 Material Assets Traffic and Transport and the Traffic and Transportation Assessment submitted with the planning application.

13.1.1 Expertise & Qualifications

This chapter was completed by Tanmay Gojamgunde. Tanmay is an environmental consultant in the Air Quality & Climate section of AWN Consulting, a Trinity Consultants Company. He holds a MSc in Air Pollution Management and Control from the University of Birmingham and has also completed BTech in Environmental Engineering. As part of the MSc, he worked on 'The Impact of bus-fleet electrification on air quality in Birmingham' utilising advanced dispersion modelling tools and emission inventory toolkit. Prior to joining AWN, Tanmay contributed to several key environmental projects in India, including Delhi's first air quality monitoring program (R ASMAN), air quality and traffic planning assessments with IIT Kanpur, and an Environmental Impact Assessment Report (EIAR) for an industrial district in Kanpur. He also specialises in conducting air dispersion modelling assessments of emissions, emission inventories, R programming and extends to broader aspects of environmental engineering.

This chapter was reviewed by Ciara Nolan. Ciara is a principal environmental consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 8 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda, MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

13.1.2 Aspects Relevant to this Assessment

During the construction phase construction dust emission have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Construction phase impacts will be short-term in duration.

Engine emissions from vehicles accessing the site have the potential to impact air quality during the operational phase of the development through the release of nitrogen dioxide (NO_2) and particulate matter (as PM_{10} and $PM_{2.5}$). Operational phase impacts will be long-term in duration.

13.2 Methodology

13.2.1 Relevant Legislation & Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality are summarised below.

- Guidance on the Assessment of Dust from Demolition and Construction v2.2 (Institute of Air Quality Management [IAQM] (hereafter refered to as the IAQM Guidelines) (IAQM, 2024);
- A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020); and
- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (Transport Infrastructure Ireland [TII], 2022).

In addition to specific air quality guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018); and
- Environmental Impact Assessment (EIA) Directive Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017).

13.2.2 Criteria for Rating of Impacts

13.2.2.1 Ambient Air Quality Standards

To reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or *'Air Quality Standards'* are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland are set out in Directive (EU) 2024/2881 *of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast)*. This directive supersedes EU Directive 2008/50/EC *of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe* (CAFE Directive). Directive (EU) 2024/2881 sets out air quality standards for pollutants to be reached by 2026 and by 2030 which are more closely aligned with the World Health Organisation (WHO) air quality guidelines.

The ambient air quality limit values for pollutants are set out in Annex I of Directive (EU) 2024/2881. Table 1 of Annex I in Directive (EU) 2024/2881 sets out the updated air quality limit values for pollutants to be achieved by 1 January 2030, which

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are more closely aligned with the WHO air quality guidelines. Table 2 of Annex I in Directive (EU) 2024/2881 sets out the limit values for air pollutants which are to be achieved by 11 December 2026 and are also applicable up to 2030. The limit values in Table 2 of Annex I are the same as the limits set under Directive 2008/50/EC and the Air Quality Standards Regulations 2022.

The Ambient Air Quality Standards Regulations 2022 (S.I. 739 of 2022) (the Air Quality Standards Regulations 2022) further transposed the CAFE Directive and revoked the Air Quality Standards Regulations 2011, as amended. With the adoption of Directive (EU) 2024/2881, Ireland must transpose this directive into national law, i.e. update the Air Quality Standards Regulations, before December 2026..

In relation to the proposed development, the applicable limit values are for nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). Table 13-1 outlines the limit values pre-2030 and post-2030 for the specified pollutants.

Table 13.1 Ambient Air Quality Limit Values

Pollutant	Directive (EU) 2024/2881 Annex I Table 2		Directive (EU) 2024/2881 Annex I Table 1	
	Limit Type	Limit Value (to be attained by 2026 and applicable until 2030)	Limit Type	Limit Value (to be attained by 2030)
Nitrogen Dioxide (NO_2)	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m³	Hourly limit for protection of human health - not to be exceeded more than 3 times/year	200 µg/m³
	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	50 µg/m³
	Annual limit for protection of human health	40 µg/m³	Annual limit for protection of human health	20 µg/m³
Particulate Matter (as PM_{10})	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m³	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m³
	Annual limit for protection of human health	40 µg/m³	Annual limit for protection of human health	20 µg/m³
Particulate Matter (as $PM_{2.5}$)	N/A	N/A	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m³
	Annual limit for protection of human health	25 µg/m³	Annual limit for protection of human health	10 µg/m³

13.2.2.2 WHO Air Quality Guidelines & Clean Air Strategy

In April 2023, the Government of Ireland published the *Clean Air Strategy for Ireland* (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026 (Table 13-2), the IT4 targets by 2030 and the final targets by 2040 (Table 13-2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 µg/m³. The strategy also acknowledges that "*meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2*".

Annex II of Directive (EU) 2024/2881 gives assessment thresholds which align with the clean air strategy final 2040 WHO targets. Directive (EU) 2024/2881 states that *"Member States shall endeavour to achieve and preserve the best ambient air quality and a high level of protection of human health and the environment, with the aim of achieving a zero-pollution objective as referred to in Article 1(1), in line with WHO recommendations, and below the assessment thresholds laid down in Annex II."*

These assessment thresholds relate to monitoring of ambient air quality by Member States, where *"exceedances of the assessment thresholds specified in Annex II shall be determined on the basis of concentrations during the previous 5 years where sufficient data are available. An assessment threshold shall be deemed to have been exceeded if it has been exceeded during at least 3 separate years out of those previous 5 years."*

Table 13.2 WHO Air Quality Guidelines 2021

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	24-hour limit for protection of human health	-	-	25 µg/m³
	Annual limit for protection of human health	20 µg/m³	-	10 µg/m³
PM (as PM_{10})	24-hour limit for protection of human health	75 µg/m³	50 µg/m³	45 µg/m³
	Annual limit for protection of human health	30 µg/m³	20 µg/m³	15 µg/m³
PM (as $PM_{2.5}$)	24-hour limit for protection of human health	37.5 µg/m³	25 µg/m³	15 µg/m³
	Annual limit for protection of human health	15 µg/m³	10 µg/m³	5 µg/m³

The applicable air quality limit values for the purposes of this assessment are those set out in Table 13-1. The pre-2030 limit values in Table 2 of Annex I of Directive (EU) 2024/2881 are applicable for the construction phase and Opening Year 2026 for the proposed development. The limit values stipulated in Table 1 of Annex I of Directive (EU) 2024/2881 are applicable for the Design Year 2042 for the proposed development.

13.2.2.3 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$). The EU ambient air quality standards outlined in Table 13-1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

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With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m^2/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

13.2.2.4 Air Quality & Traffic Significance Criteria

The Transport Infrastructure Ireland (TII) guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the Do Nothing scenario. The TII significance criteria are outlined in Table 4.9 of *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022) and reproduced in Table 13-3 below. These criteria have been adopted for the proposed development to predict the impact of NO_2, PM_{10} and $PM_{2.5}$ emissions as a result of the proposed development.

Table 13.3 Air Quality & Traffic Significance Criteria

Long-term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Limit Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022))

As per Table 13-3 a neutral effect is one where a change in concentration at a receptor is:

- 5% or less where the Opening Year, without the proposed development, annual mean concentration is 75% or less of the standard; or
- 1% or less where the Opening Year, without the proposed development, annual mean concentration is 94% or less of the standard.

Where an effect does not meet the criteria for neutral, as described above, the effect can either be positive or negative. The TII guidance (TII, 2022) states that "*the evaluation of significance of effects for the operational phase should be undertaken for the Opening Year only as the Design Year is likely to show lower total pollutant concentrations and changes in concentration*" (TII, 2022).

Non-significant effects (i.e. of local importance only) are '*neutral*' or '*slight*' changes in concentrations while significant effects can be changes in pollutant concentrations that are either '*moderate*' or '*substantial*'. However, the TII guidance (TI, 2022) states that these must be considered in the context of the project and '*moderate*' or '*substantial*' increases are not necessarily always significant effects.

The impact descriptors in Table 13-3 are used to describe the impact at each modelled receptor location, and the significance of the impacts is then determined, aligning with the terminology in the EPA guidelines (EPA, 2022). Whilst it may be determined that there are '*slight*', '*moderate*' or '*substantial*' impacts at one or more receptors, an overall judgement should be made of whether the proposed development is '*significant*' or '*not significant*' in terms of air quality. Factors to consider when determining the overall significance of a proposed development are provided in Table 4.10 of the TII guidance (TII, 2022).

13.2.3 Construction Phase

13.2.3.1 Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (IAQM, 2024) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022).

The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The criteria for determining the category for the works involved are outlined in Table 13-4, these are based on the IAQM guidance (IAQM, 2024). The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

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Table 13.4 IAQM Criteria to Determine Dust Emissions Magnitude

Dust Emission Magnitude		
Small	**Medium**	**Large**
Demolition		
• Total building volume <12,000 m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities <6 m above ground • Demolition during wetter months	• Total building volume 12,000 - 75,000 m^3 • Potentially dusty construction material • Demolition activities 6 – 12 m above ground level	• Total building volume >75,000 m^3 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities >12 m above ground level
Earthworks		
• Total site area <18,000 m^2 • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <3 m in height • Earthworks during wetter months	• Total site area 18,000 m^2 - 110,000 m^2 • Moderately dusty soil type (e.g. silt) • 5 – 10 heavy earth moving vehicles active at any one time • Formation of bunds 3 – 6 m in height	• Total site area >110,000 m^2 • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >6 m in height
Construction		
• Total building volume <12,000 m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)	• Total building volume 12,000 - 75,000 m^3 • Potentially dusty construction material (e.g. concrete) • On-site concrete batching	• Total building volume >75,000 m^3 • On-site concrete batching • Sandblasting
Trackout (Truck Movements)		
• <20 HDV (>3.5 t) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50 m	• 20 – 50 HDV (>3.5 t) outward movements in any one day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50 – 100 m	• >50 HDV (>3.5 t) outward movements in any one day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100 m

Once the dust emission magnitude has been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling, human health and ecological effects. The level of risk associated with each activity is determined using the criteria in Table 13-5.

Table 13.5 IAQM Criteria to Determine Risk of Dust Impacts

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
Demolition			
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible
Earthworks			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible

13.2.3.2 Construction Phase Traffic Assessment

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022), states that road links meeting one or more of the following criteria can be defined as being '*affected*' by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

MHL Consulting Engineers have prepared a Traffic and Transport Impact Assessment for the proposed development, enclosed separately, and have prepared Chapter 6 Material Assets – Traffic and Transport of this EIAR. As per Chapter 6, it has been determined by MHL Consulting Engineers that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT, or that the development will not result in speed changes or changes in road alignment during the construction phase.

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Therefore, the traffic does not meet the above scoping criteria. A detailed air quality assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality with respect with human or ecological receptors.

13.2.4 Operational Phase

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The TII scoping criteria detailed in Section 13.2.3.2 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. MHL Consulting Engineers have prepared a Traffic and Transport Impact Assessment for the proposed development, enclosed separately, and have prepared Chapter 6 Material Assets – Traffic and Transport. There is predicted to be a greater than 1,000 AADT increase on a small number of road links. As a result, an assessment of traffic related emissions was conducted. Additionally, traffic associated with other cumulative developments in the vicinity of the proposed development was included in the figures supplied to ensure a full cumulative assessment was conducted. See Traffic and Transport Assessment and Chapter 6 Material Assets – Traffic and Transport for further details.

The impact of traffic emissions on air quality is assessed for both human and ecological receptors within 200 m of impacted roads as per the TII PE-ENV-01106 guidance (TII, 2022). The following sections describe the methodology for each assessment.

The impact to air quality as a result of changes in traffic is assessed at sensitive human receptors in the vicinity of affected roads. These are discussed in further detail within Section 13.5.3.2 and shown graphically in Figure 13-3.

The TII guidance (2022) states that modelling should be conducted for NO_2, PM_{10} and $PM_{2.5}$ for the Base, Opening and Design Years for both the Do Minimum (Do Nothing – i.e. assuming the proposed development is not in place) and Do Something (with the proposed development in place) scenarios. Modelling of operational NO_2, PM_{10} and $PM_{2.5}$ concentrations has been conducted for the Do Nothing and Do Something scenarios using the TII Road Emissions Model (REM) online calculator tool (TII, 2025).

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy-duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The *Default* fleet mix option was selected along with the *Intermediate Case* fleet data base selection for cars, the *ICE Sales Ban 2035* fleet data base for LGVs and the *EU Target* for the HGV fleet data base, as per TII Guidance (TII, 2025). The Intermediate Case assumes a linear interpolation between the Business-as-Usual case – where current trends in vehicle ownership continue and the Climate Action Plan (CAP) case – where adoption of low emission light duty vehicles occurs. The ICE Sales Ban 2035 represents a sales ban on new combustion engine vehicles to be implemented by 2035, and the EU Target for HGV represents interim targets for emissions from sales of new HGVs.

Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the identified sensitive receptors using generic meteorological data. The TII REM uses county-based Irish fleet composition for different road types, for different European emission standards from pre-Euro to Euro 6/VI with scaling factors to reflect improvements in fuel quality, retrofitting, and technology conversions. The TII REM also includes emission factors for PM_{10} emissions associated with brake and tyre wear (TII, 2024). The predicted road contributions are then added to the existing background concentrations to give the predicted ambient concentrations. The ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII guidance (2022) also states that impacts to sensitive ecology due to traffic emissions should be considered. Consideration should be given to designated sites within 2km of the proposed development. However, a detailed assessment is only required at a local level, where there is a designated site within 200m of impacted road links. The TII guidance (TII, 2022) notes that only sites that are sensitive to nitrogen and acid deposition need to be included in the assessment. It is not necessary to include sites for example that have been designated as a geological feature or water course. There are no designated ecological sites within 200m of the site or impacted road links and therefore no assessment was required as there is no potential for significant impacts to the designated sites due to changes in air quality.

13.2.4.1 Traffic Data used in Modelling Assessment

Traffic flow information is detailed in Table 13.6 as obtained from MHL Consulting Engineers for the purposes of this assessment. Data for the Base Year 2024 and the Do Nothing and Do Something scenarios for the Opening Year 2027 and Design Year 2042 were provided. The traffic data included traffic associated with the development site and other cumulative sites as relevant (see Chapter 6 for further details).

Traffic data for the N40 was obtained from the TII website for the traffic counter on the N40 between J02 Curraheen and J03 Wilton, to the direct north of the site. Data for the year 2024 was utilised as this had 100% data capture for AADT and %HGV values. The traffic assessment for the proposed development conducted by MHL did not include the N40 road to the north of the site, as traffic associated with the proposed development is not predicted to significantly increase traffic on the N40. As such it was not possible to obtain predicted future year traffic figures for this road link to inform the air quality assessment. In order to calculate an estimate of the potential air quality impact from the traffic emissions from the N40 on the future residential properties within the proposed development adjacent to the N40, the traffic data from 2024 was utilised for the opening year 2027 and design year 2042.

The modelling assessment has been undertaken for road links that were within 200 m of receptors. Background concentrations have been included as per Section 13.5.2 of this chapter based on available EPA background monitoring data (EPA, 2024).

Table 13.6 Traffic Data used in Operational Phase Air Quality Assessment

Road Name	Speed (kph)	Base Year	Opening Year		Design Year	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Development Road	30	1538 (31)	1538 (31)	3548 (72)	1538 (31)	3548 (72)
Waterfall Road J1-J2	50	5860 (181)	8035 (248)	9731 (301)	9100 (281)	10785 (334)
Waterfall Road J2-J3	50	5657 (115)	7436 (152)	8755 (179)	8469 (173)	9776 (200)
Waterfall Road J3-J4	50	5795 (179)	7611 (235)	8915 (276)	8665 (268)	9959 (308)
N40	100	47851 (1582)	47851 (1582)	47851 (1582)	47851 (1582)	47851 (1582)

13.3 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

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13.4 Consultation

Appendix C of the Opinion from Cork City Council included a section related to air quality which stated

> *"Air Quality Assessment to be carried out to take account of both construction and operational stages impact on surrounding properties as well as the properties within the development itself. On site monitoring required to establish baseline conditions.*
>
> *Given the proximity of the proposed development site to the N40, Waterfall Road, pump station and steel yard, the primary focus of the report shall outline the potential air quality impact from the existing road network and emissions generated from traffic on habitants of the properties both internal and external as well as within the amenity spaces. The Air Quality levels at the various floors of apartment blocks shall also be included. As a minimum PM_{10}, $PM_{2.5}$ and NO_2 shall be monitored on site."*

The air quality assessment included within this EIAR chapter includes both construction and operational phase impacts to air quality. Additionally, the operational phase assessment of traffic emissions has included the potential impact on a representative site specific property in order to address the concerns of the Council.

13.5 Baseline Environment

13.5.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Cork Airport meteorological station, which is located approximately 3.5 km south-east of the site. Cork Airport meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (Figure 13-1). For data collated during five representative years (2020 – 2024), the predominant wind direction is westerly to south-westerly with generally moderate wind speeds (Met Éireann, 2025).

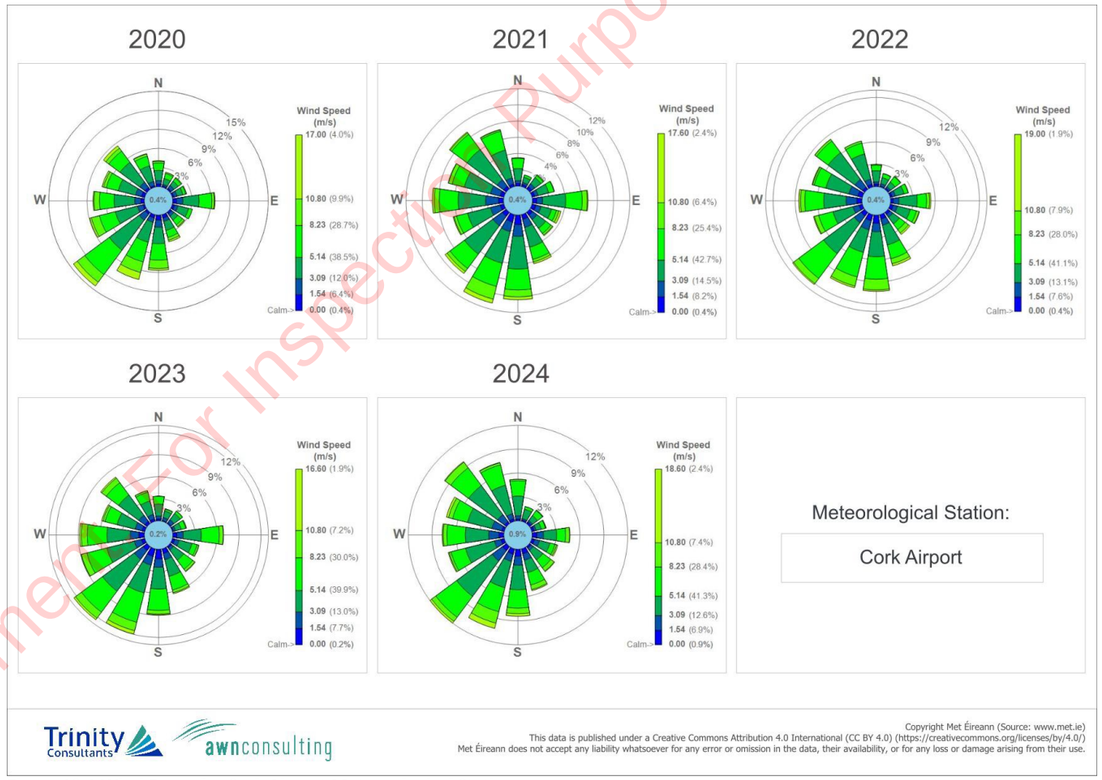


Figure 13.1 Wind Roses for Cork Airport Meteorological Station

13.5.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is *'Air Quality In Ireland 2023'* (EPA, 2024). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments.

As part of the implementation of the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022) ,as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2024). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone B (EPA, 2024). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.). The use of publicly available long-term datasets is recommended by TII in their PE-ENV-0016 guidance

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(2022). This use of long-term data sets is preferred over on-site baseline air monitoring surveys as it gives a better indication of long-term trends in air quality. The use of long-term monitoring data from the EPA is considered appropriate for determining the background air quality in the area of the proposed development.

Continuous monitoring by the EPA is carried out at a number of monitoring stations within Zone B; these include urban background sites, roadside (traffic) sites and suburban background sites. It is necessary to select monitoring stations that are representative of the site location. Not all monitoring stations are considered suitable for determining background pollutant concentrations and must be reviewed on a case-by-case basis to determine the most appropriate EPA monitoring sites for the current assessment.

The EPA, on their website (EPA, 2025), state that background sites generally represent overall area-wide exposure more closely than roadside sites. Roadside monitoring sites are heavily influenced by traffic emissions and are not considered representative of area-wide pollutant levels.

The full suite of EPA Zone B monitoring locations were reviewed. These included urban traffic (Cork Glanmire Road), suburban traffic (South Link Road) and suburban background (Heatherton Park, UCC Distillery Fields, Bishopstown MTU) locations. Suburban background was determined to be the most representative background for the area of the proposed development. Influences from traffic emissions will be captured within the traffic modelling assessment and therefore, suburban background concentrations give the best indication of other, non-traffic derived sources of pollutants.

13.5.2.1 NO_2

Long-term NO_2 monitoring was carried out at the representative Zone B suburban background location of UCC Distillery Fields for the period 2019 – 2023 (Table 13-7) (EPA, 2024). Long-term average concentrations are significantly below the annual average limit of 40 µg/m³. Average results range from 8 – 10 µg/m³. The overall annual average concentration for this 5-year period is 9 µg/m³. Additionally, there were no exceedances of the hourly limit value of 200 µg/m³. Based on the above information a conservative estimate of the current background NO_2 concentration for the region of the proposed development is 9 µg/m³.

Table 13.7 Trends In Zone B Air Quality - Nitrogen Dioxide (NO_2)

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
UCC Distillery Fields	Annual Mean NO_2 (µg/m³)	10	8	9	9	8
	1-hr Mean > 200 µg/m³ (days)	-	0	0	0	0

15.5.2.2 PM_{10}

Continuous PM_{10} monitoring was carried out at two representative Zone B locations from 2019 – 2023; Bishopstown MTU and Heatherton Park. Annual average PM_{10} concentrations across the sites ranged from 11 – 15 µg/m³ over the 2019 – 2023 period (Table 13-8). The overall annual average concentration for this 5-year period is 13 µg/m³. There were at most 2 exceedances of the daily limit of 50 µg/m³ in 2020 (at Heatherton Park). However, 35 exceedances are permitted per year (EPA, 2024). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 13 µg/m³.

Table 13.8 Trends In Zone B Air Quality - PM_{10}

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Bishopstown MTU	Annual Mean PM_{10} (µg/m³)	15	14	13	14	11
	24-hr Mean > 50 µg/m³ (days)	-	0	1	0	-
Heatherton Park	Annual Mean PM_{10} (µg/m³)	-	11	11	12	11
	24-hr Mean > 50 µg/m³ (days)	-	2	1	0	-

13.5.2.3 $PM_{2.5}$

Average $PM_{2.5}$ levels in Heatherton Park, UCC Distillery Fields and Bishopstown MTU over the period 2019 - 2023 ranged from 5 - 8 µg/m³ (EPA, 2024). The overall annual average concentration for this 5-year period is 7 µg/m³ (Table 13-9). Based on this information, an estimate of the background $PM_{2.5}$ concentration in the region of the proposed development is 7 µg/m³.

Table 13.9 Trends In Zone B Air Quality - $PM_{2.5}$

Station	Averaging Period	Year				
		2019	2020	2021	2022	2023
Heatherton Park	Annual Mean $PM_{2.5}$ (µg/m³)	8	8	8	5	6
UCC Distillery Fields	Annual Mean $PM_{2.5}$ (µg/m³)	8	7	7	5	-
Bishopstown MTU	Annual Mean $PM_{2.5}$ (µg/m³)	-	-	-	-	7

13.5.2.4 Summary

Based on the above information the air quality in the suburban Cork area is generally good, with concentrations of the key pollutants generally well below the current relevant limit values set out in Table 2 of Annex I of Directive (EU) 2024/2881. The current pollutant concentrations at these monitoring sites are also in compliance with the 2030 limit values set out in Directive (EU) 2024/2881 and the clean air strategy, however, concentrations are approaching the limit values. Further measures will be needed at a national scale to reduce air pollution in future years. The EPA have indicated that road transport emissions are contributing to increased levels of NO_2 with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2024).

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13.5.3 Sensitivity of the Receiving Environment

13.5.3.1 Construction Phase

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction'* (IAQM, 2024) prior to assessing the impact of dust from a proposed development, the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity. Table 13-10 outlines the criteria for determining the sensitivity of the area to dust soiling and dust-related human health effects as per the IAQM guidance (IAQM, 2024).

Table 13.10 Criteria for Determining the Sensitivity of the Area

Sensitivity of the Area to Dust Soiling Effects on People and Property					
Receptor Sensitivity	**Number of Receptors**	**Distance from Source (m)**			
		<20	**<50**	**<100**	**<250**
High	>100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	**Medium**	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Sensitivity of the Area to Human Health Impacts						
Receptor Sensitivity	**Annual Mean PM_{10} Concentration**	**Number of Receptors**	**Distance from Source (m)**			
			<20	**<50**	**<100**	**<250**
High	< 24 µg/m³	>100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	**Low**	Low	Low	Low
Medium	< 24 µg/m³	>10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	< 24 µg/m³	>1	Low	Low	Low	Low

In terms of receptor sensitivity to dust soiling, there are a number of highly sensitive residential properties within 100 m of the proposed development boundary (Figure 13-2). There are 1-10 high sensitivity residential properties and 1 medium sensitivity commercial receptor within 20m of the site boundary, there are a further 1-10 high sensitivity receptors and a medium sensitivity receptor within 50m and >100 properties within 100m of the site boundary. Based on these receptor numbers and using the IAQM criteria in Table 13-10, the sensitivity of the area to dust soiling impacts from the proposed development is medium.

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 13 µg/m³. There are 1-10 high sensitivity residential properties and a medium sensitivity commercial receptor within 20 m of the proposed development boundary (Figure 13-2). Based on the IAQM criteria outlined in Table 13-10 the worst-case sensitivity of the area to dust-related human health effects is low.

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant, as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50 m from the site, and 50 m from site access roads, up to 250 m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present. There are no sensitive ecological receptors that meet these criteria within the study area and there is no potential for impacts to sensitive ecology from construction dust emissions and no further assessment is required.

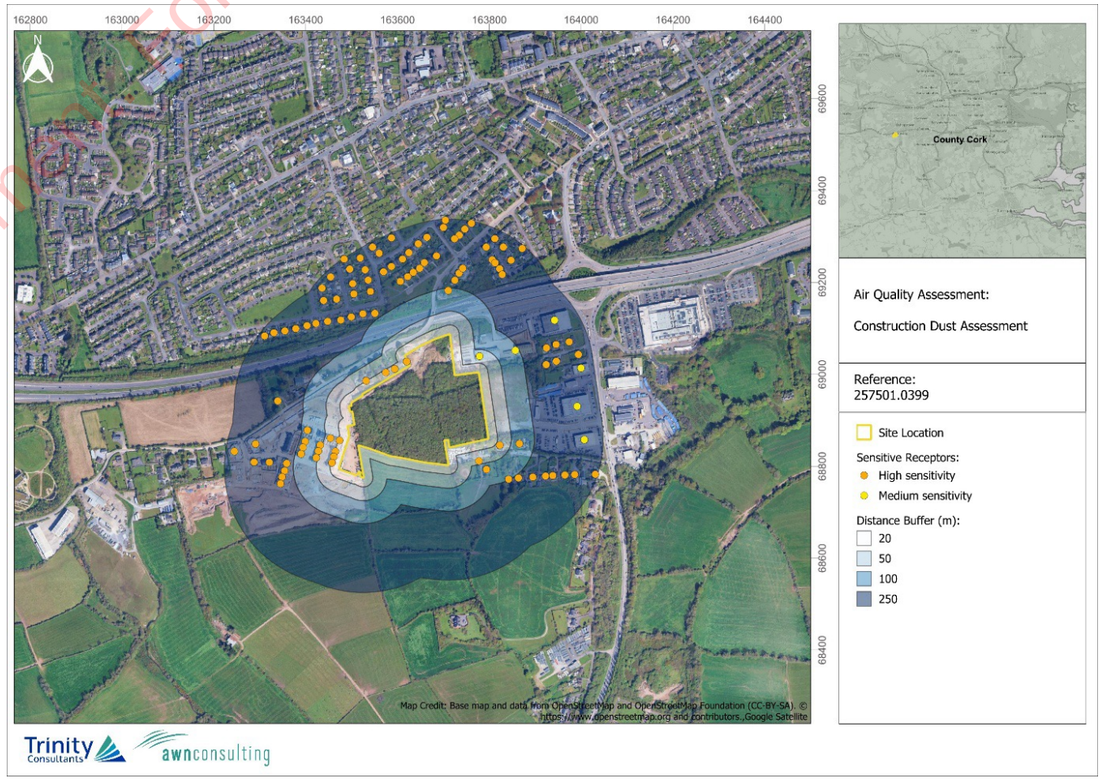


Figure 13.2 Sensitive Receptors within 250m of Site

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13.5.3.2 Operational Phase

The impact to air quality due to changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (2022) states that a proportionate number of representative receptors, which are located in areas which will experience the highest concentrations or greatest improvements because of the proposed development, are to be included in the modelling. The TII criteria state that receptors within 200 m of impacted road links should be assessed; roads which are greater than 200 m from receptors will not impact pollutant concentrations at that receptor (TII, 2022). The TII guidance (2022) defines sensitive receptor locations for the purposes of modelling annual mean pollutant concentrations as: residential housing, schools, hospitals, care homes and short term-accommodation such as hotels, i.e. locations where members of the public are likely to be regularly present for 24 hours. A total of 6 no. high sensitivity residential receptors (R1, R2, R3, R4, R5 and R6) were included in the modelling assessment associated with the impacted road links (Link 1, Link 2, Link 3, Link 4 and N40 section) (see Figure 13-3).

Receptors R1, R2, R3 and R4 represent existing residential properties within 200m of impacted road links. Receptors R5 and R6 are representative of an apartment block and a residential property, respectively, within the proposed development and were chosen specifically to assess the impact of traffic from the existing N40 and Waterfall Road on the future inhabitants of the proposed development. The receptors chosen are representative of the affected receptors within 200m of impacted roads and all other receptors in these areas will experience similar or lesser air quality related impacts from traffic emissions.

The Opinion item in relation to air quality requested the impact of traffic emissions, discussed in Section 13.4, be assessed at varying heights of apartment buildings in the proposed development. Pollutant concentrations from traffic emissions will be highest in closest proximity to the source, at road level. Pollutant concentrations will decrease with increasing distance from the road and at increasing heights. Therefore, it was not deemed necessary to model receptors a varying heights in the proposed apartment buildings. Receptor R5 is representative of a proposed apartment block within the development in closest proximity to the impacted roads and predicted pollutant concentrations will not significantly impair the local air quality in the area (see Section 13.7.2 for modelling assessment results).

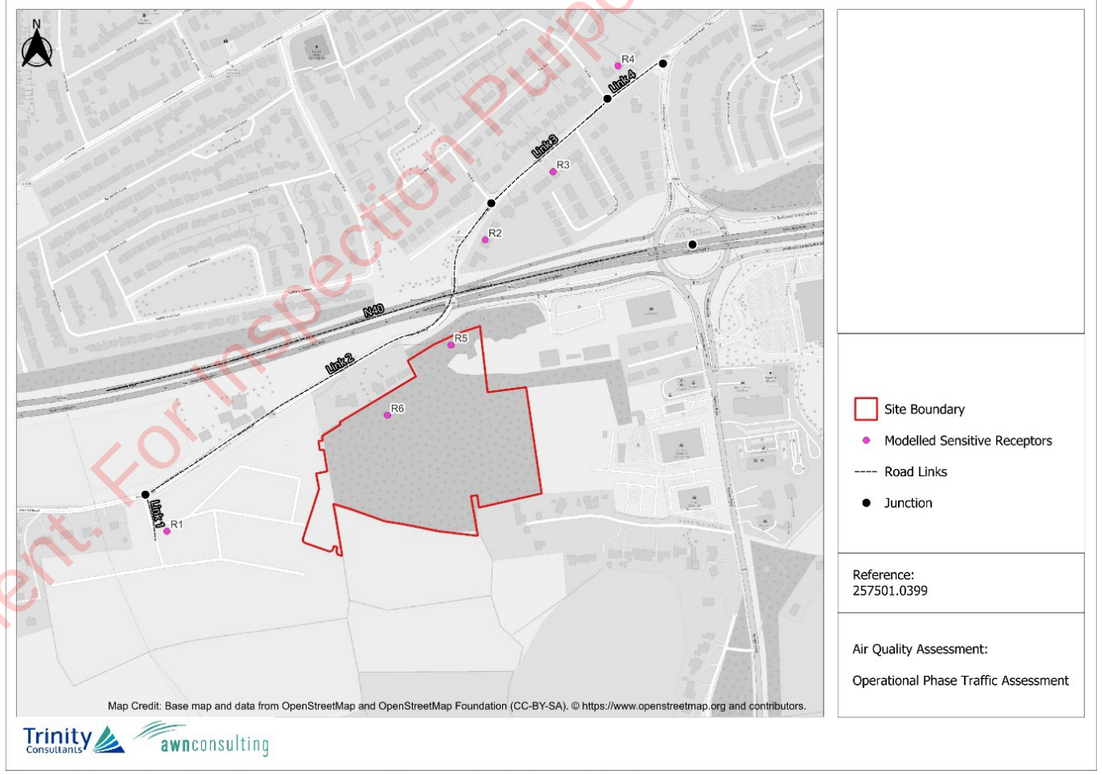


Figure 13.3 Location of Sensitive Receptors used in Operational Phase Air Quality Assessment

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13.6 The 'Do Nothing' Scenario

In the Do-Nothing scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

The Do Nothing scenario associated with the operational phase of the development is assessed within Section 13.7.2 and it was found to be ***direct, long-term, negative*** and ***slight*** which is overall ***not significant***.

13.7 Potential Significant Effects

13.7.1 Construction Phase

13.7.1.1 Construction Dust Assessment

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 250 m of a construction site, the majority of the deposition occurs within the first 50 m (IAQM, 2024). The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Cork Airport meteorological data indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature (Section 13.5.1). In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30-year average data for Cork Airport meteorological station indicates that on average 194 days per year have rainfall over 0.2 mm (Met Éireann, 2025). Therefore, it can be determined that 53% of the time dust generation will be reduced due to natural meteorological conditions.

To determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (Section 13.5.3.1). The major dust generating activities are divided into four types within the IAQM (IAQM, 2024) guidance to reflect their different potential impacts. These are: demolition, earthworks, construction and trackout (movement of heavy vehicles).

13.7.1.1.1 Determining the Potential Dust Emission Magnitude

The magnitude of the works under each category can be classified as either small, medium or large depending on the scale of the works involved. The magnitude of each activity has been determined below for the proposed development using the criteria in Table 13-4.

- Demolition: The dust emission magnitude for the demolition activities is not applicable as there is no demolition required as part of the proposed development.
- Earthworks: The dust emission magnitude for the proposed earthwork activities can be classified as medium as the total site area is between 18,000 – 110,000 m^2.
- Construction: The dust emission magnitude for the proposed construction activities can be classified as medium as a worst-case as the total volume of buildings to be constructed will be 12,000 - 75,000 m^3.
- Trackout: The dust emission magnitude for the proposed trackout can be classified as medium, as there will be between 20 - 50 outward HGV movements per day during the construction phase of the proposed development.

13.7.1.1.2 Determining the Risk of Dust Impacts

Once the dust emission magnitude has been determined the next step, according to the IAQM guidance (IAQM, 2024), is to establish the level of risk by combining the magnitude with the overall sensitivity of the area to dust soiling and dust-related human health effects (Section 13.5.3.1). The level of risk associated with each activity is determined using the criteria in Table 13-5. The overall risk of dust impacts from the construction works is shown in Table 13-11 for each category.

- Demolition: There is no demolition required as part of the proposed development.
- Earthworks: As the overall sensitivity of the area to dust soiling is medium, when combined with a medium dust emission magnitude, this produces an overall medium risk of dust soiling impacts (as per the criteria in Table 13-5). As the overall sensitivity of the area to dust-related human health effects is low, this results in a low risk of dust-related human health effects (as per the criteria in Table 13-5).
- Construction: Combining the medium dust emissions magnitude for the construction activities with the medium sensitivity to dust soiling results in a medium risk of dust soiling impacts using the criteria in Table 13-5. There is an overall low risk of dust-related human health impacts as a result of the proposed construction activities.
- Trackout: Combining the medium dust emission magnitude for the trackout activities with the medium sensitivity to dust soiling results in a medium risk of dust soiling impacts using the criteria in Table 13-5. There is an overall low risk of dust-related human health impacts as a result of the proposed trackout activities.

There is at most a medium risk of dust soiling impacts and a low risk of dust-related human health impacts associated with the proposed works. As a result, best practice dust mitigation measures associated with medium-risk works will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, dust impacts are predicted to be ***direct, short-term, negative*** and ***slight***.

Table 13.11 Risk of Dust Impacts used to Define Site-Specific Mitigation

Receptor	Receptor Sensitivity	Dust Emission Magnitude	Risk of Dust-Related Impacts
Demolition			
Dust Soiling	Medium	n/a	n/a
Human Health	Low		n/a
Earthworks			
Dust Soiling	Medium	Medium	Medium Risk
Human Health	Low		Low Risk
Construction			
Dust Soiling	Medium	Medium	Medium Risk
Human Health	Low		Low Risk
Trackout			
Dust Soiling	Medium	Medium	Medium Risk
Human Health	Low		Low Risk

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13.7.1.2 Construction Phase Traffic Assessment

There is also the potential for traffic emissions to impact air quality with respect to human health in the short-term over the construction phase, particularly, due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed, and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII assessment criteria in Section 13.2.3.2.

Therefore, it can be determined that the construction stage traffic will have an imperceptible, neutral, short-term and not significant impact on air quality.

13.7.2 Operational Phase

There is the potential for vehicles accessing the site to result in emissions of NO_2, PM_{10} and $PM_{2.5}$.

13.7.2.1 Operational Phase Traffic Assessment

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated due to the development. The traffic data has included specific cumulative developments within the area to provide for a worst-case assessment and to assess potential cumulative impacts (see Transport Assessment and Chapter 6 Traffic & Transportation, both prepared by MHL Consulting Engineers for further details).

The traffic data includes the Do Nothing (DN) scenario and Do Something (DS) scenario. The impact of NO_2, PM_{10} and $PM_{2.5}$ emissions for the Opening and Design Years was predicted at the nearest sensitive receptors to the impacted road links. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

The TII guidance PE-ENV-01106 (TII, 2022) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects. However, this significance criteria can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do Nothing' scenario, which assumes that the proposed development is not in place in future years, to determine the degree of impact.

Traffic related air emissions have the potential to impact air quality which can affect human health. The following details the results of the air dispersion modelling assessment of traffic emissions to determine the impact to human health. The predicted pollutant concentrations have been compared against the ambient air quality limit values set out in Table 13-1. The current limit values set out in Table 2 of Annex I of Directive (EU) 2024/2881 are applicable to the Opening Year 2027 and the limit values set out in Table 1 of Annex I of Directive (EU) 2024/2881 are applicable to the Design Year 2042 as the assessment year is post-2030.

13.7.2.1.1 NO_2

The results of the NO_2 modelling are shown in Table 13-12. In the Opening Year 2027, predicted annual mean concentrations of NO_2 are in compliance with the annual mean limit value of 40 µg/m³ reaching at most 29% of the limit. In addition, the TII guidance (2022) states that the hourly limit value for NO_2 of 200 µg/ m³ is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m³. As predicted NO_2 concentrations are significantly below 60 µg/m³ (Table 13-12), it can be concluded that the short-term NO_2 limit value will be complied with at all receptor locations. Some increases in NO_2 concentrations are predicted at the worst-case receptors assessed in the Opening Year when compared with the Do-Nothing scenario (see Table 13-12). Concentrations are predicted to increase by at most 0.49 µg/m³ at receptor R1. When comparing the change in concentration with the air quality limit value, it results in a maximum change of 1.23% at receptor R1. The other receptor in the area will experience similar or lesser impacts and all increases are considered 'neutral' as per the TII criteria in Table 13-3.

In the Design Year 2042, predicted annual mean NO_2 concentrations are in compliance of the limit value of 20 µg/m³ at the worst-case receptors assessed, reaching at most 46% of the limit. The proposed development will result in a 'neutral' increase in NO_2 concentrations according to the TII significance criteria in Table 13-3, with concentrations increasing by at most 0.03 µg/m³ as a result of the proposed development (at receptor R1, see Table 13-12), which is an increase of 0.15% when compared with the applicable annual mean limit value for NO_2. Therefore, the impact of the proposed development on NO_2 concentrations is neutral.

Table 13.12 Predicted Annual Mean NO_2 Concentrations (µg/ m³)

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	9.4	23%	9.9	25%	0.49	1.23%	Neutral
R2	10.4	26%	10.6	27%	0.28	0.70%	Neutral
R3	10.2	26%	10.4	26%	0.21	0.53%	Neutral
R4	10.1	25%	10.3	26%	0.19	0.48%	Neutral
R5	11.5	29%	11.7	29%	0.21	0.53%	Neutral
R6	9.6	24%	9.7	24%	0.07	0.18%	Neutral
Receptor	**Impact Design Year**						
	DN	**% of AQLV**	**DS**	**% of AQLV**	**DS-DN**	**% Change of AQLV**	**Description**
R1	9.0	45%	9.1	45%	0.03	0.15%	Neutral
R2	9.1	46%	9.1	46%	0.01	0.05%	Neutral
R3	9.1	45%	9.1	46%	0.02	0.10%	Neutral
R4	9.1	45%	9.1	45%	0.01	0.05%	Neutral
R5	9.1	46%	9.1	46%	0.01	0.05%	Neutral
R6	9.0	45%	9.0	45%	0.01	0.05%	Neutral

13.7.2.1.2 PM_{10}

The results of the PM_{10} modelling can be seen in Table 13-13 for the Opening Year 2027 and Design Year 2042.

In the Opening Year 2027, annual mean PM_{10} concentrations are in compliance with the annual mean limit value of 40 µg/m³ reaching at most 37% of the limit. In the Design Year 2042 annual mean PM_{10} concentrations are also in compliance with the annual mean limit value of 20 µg/m³ reaching at most 73% of the limit. In addition, the proposed development will not result in any days of exceedance of the daily PM_{10} limit value (Table 13-2) in both the opening and design years.

The changes in PM_{10} concentrations as a result of the proposed development can be assessed relative to the 'Do Nothing' (DN) levels. In the Opening Year 2027 annual PM_{10} concentrations will increase by at most 0.44 µg/m³ at receptor R1, this is a 1.1% increase when compared with the annual mean limit value of 20 µg/m³. This is considered a 'neutral' impact as per the TII criteria in Table 13-3. The other receptor in the area will experience similar or lesser impacts and all increases at other modelled receptors are considered 'neutral' as per the TII criteria in Table 13-3.

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In the Design Year 2042 the proposed development will result in a maximum increase of 0.38 µg/m³ at receptor R1, which is a 1.9% increase when compared with the annual mean limit of 20 µg/m³. The changes in concentrations in the Design Year are considered 'neutral' based on the TII criteria in Table 13-3.

Table 13.13 Predicted Annual Mean PM_{10} Concentrations (µg/ m³).

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	13.3	33%	13.8	34%	0.44	1.10%	Neutral
R2	14.4	36%	14.7	37%	0.29	0.72%	Neutral
R3	14.2	36%	14.4	36%	0.22	0.55%	Neutral
R4	14.1	35%	14.3	36%	0.20	0.50%	Neutral
R5	14.7	37%	15.0	37%	0.21	0.52%	Neutral
R6	13.5	34%	13.5	34%	0.06	0.15%	Neutral
Receptor	Impact Design Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	13.3	66%	13.7	68%	0.38	1.90%	Neutral
R2	14.4	72%	14.6	73%	0.25	1.25%	Neutral
R3	14.2	71%	14.4	72%	0.18	0.90%	Neutral
R4	14.1	71%	14.3	71%	0.17	0.85%	Neutral
R5	14.7	73%	14.9	74%	0.18	0.90%	Neutral
R6	13.5	67%	13.5	68%	0.06	0.30%	Neutral

13.7.2.1.3 $PM_{2.5}$

In relation to changes in $PM_{2.5}$ concentrations as a result of the proposed development, the results of the assessment can be seen in Table 13-14 for the modelled Opening Year 2027 and Design Year 2042.

In the Opening Year 2027, predicted annual mean concentrations of $PM_{2.5}$ are in compliance with the annual mean limit value of 25 µg/m³ reaching at most 32% of the limit. There is predicted to be an increase in $PM_{2.5}$ concentrations at the worst-case receptors assessed in the Opening Year when compared with the Do-Nothing scenario (see Table 13-14). Concentrations are predicted to increase by at most 0.23 µg/m³ at receptor R1. When comparing the change in concentration with the air quality limit value, it results in a maximum change of 0.92% at receptor R1. This is considered a 'neutral' impact as per the TII criteria in Table 13-3. The other receptor in the area will experience similar or lesser impacts and all increases at other modelled receptors are considered 'neutral' as per the TII criteria in Table 13-3.

In the Design Year 2042, predicted annual mean $PM_{2.5}$ concentrations are in compliance with the limit value of 10 µg/m³ at all receptors assessed. Concentrations reach at most 80% of the annual mean limit value. The proposed development will result in a 'neutral' increase in $PM_{2.5}$ concentrations according to the TII significance criteria Table 13-3, with concentrations increasing by at most 0.20 µg/m³ as a result of the proposed development (at receptor R1, see Table 13-14), which is an increase of 2% when compared with the annual mean limit value of 10 µg/m³ for $PM_{2.5}$.

Table 13.14 Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m³)

Receptor	Impact Opening Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	7.2	29%	7.4	30%	0.23	0.92%	Neutral
R2	7.7	31%	7.9	32%	0.15	0.60%	Neutral
R3	7.6	31%	7.8	31%	0.11	0.44%	Neutral
R4	7.6	30%	7.7	31%	0.10	0.40%	Neutral
R5	8.0	32%	8.1	32%	0.11	0.44%	Neutral
R6	7.3	29%	7.3	29%	0.03	0.12%	Neutral
Receptor	Impact Design Year						
	DN	% of AQLV	DS	% of AQLV	DS-DN	% Change of AQLV	Description
R1	7.2	72%	7.4	74%	0.20	2.00%	Neutral
R2	7.7	77%	7.9	79%	0.13	1.30%	Neutral
R3	7.6	76%	7.7	77%	0.10	1.00%	Neutral
R4	7.6	76%	7.7	77%	0.09	0.90%	Neutral
R5	7.9	79%	8.0	80%	0.10	1.00%	Neutral
R6	7.3	73%	7.3	73%	0.03	0.30%	Neutral

13.7.2.1.4 Significance of Predicted Changes in NO_2, PM_{10} and $PM_{2.5}$ Concentrations

As outlined in Section 13.2.2.4 , the TII guidance (2022) states that the significance of effects should be assessed based on the opening year only. Non-significant effects are 'neutral' or 'slight' changes in concentrations while significant effects can be changes in pollutant concentrations that are either 'moderate' or 'substantial'. However, the TII guidance (2022) states that these must be considered in the context of the project and 'moderate' or 'substantial' increases are not necessarily always significant effects.

In relation to NO_2, PM_{10} and $PM_{2.5}$ the predicted changes in concentrations are 'neutral' at the worst-case receptors assessed. Therefore, according to the TII criteria as outlined in Section 13.2.2.4, the impact is ***not significant***.

In relation to the future inhabitants of the proposed development, predicted pollutant concentrations at the representative receptors (R5 and R6) are in compliance with the relevant limit values indicating that traffic emissions for the existing road network will not significantly impact the local air quality at the proposed development site.

For the purposes of this assessment, it has been assumed that the current estimated background pollutant concentrations are applicable for both the opening and design years, with no decreases in future background concentrations allowed for. There will be some decreases in background concentrations in future years. However, at present there is no guidance-based methodology available for estimating future year background concentrations and therefore, as a conservative approach, the current estimated background concentrations have been applied to future years.

Due to the large uncertainty in future improvements in fleet composition and emissions, such as projected changes to vehicle registration and electric vehicle uptake, the future year emission rates utilised by the TII REM tool do not account for the full

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implementation of these measures. Predicted design year concentrations are therefore currently overly conservative as future emissions improvements are not fully taken into account, as well as no improvement in background concentrations being assumed.

As a result, the opening year predicted concentrations are the most appropriate for determining the significance of effects as per Section13.2.2.4.

It can be concluded that the impact of traffic emissions on air quality and human health during the operational phase is ***long-term, direct, localised, negative*** and ***not significant*** in EIA terms.

The measures set out in the Clean Air Strategy for Ireland (Government of Ireland 2023) aim to work towards solutions to ensure that air pollution concentrations are reduced in order to comply with the future changes in limit values. Ireland will need to continue to implement and develop measures to ensure continuing improvements in air quality in future years in order to meet the objectives of the Clean Air Strategy for Ireland (Government of Ireland, 2023) and to ensure the ambient air quality limit values set out in Directive (EU) 2024/2881 are achieved. The estimated background concentrations used in the assessment are the largest contribution to predicted pollutant concentrations, rather than pollutant contributions associated with the proposed development. Strategies to improve air quality at a national level in future years will contribute to reducing background concentrations and therefore it is envisioned that air quality will improve in the future.

13.7.3 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 13.15 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction Dust Impact	Negative	Not significant - slight	Localised	Likely	Short-term	Direct
Construction Traffic Impacts	Neutral	Not significant - imperceptible	Localised	Likely	Short-term	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 13.16 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Traffic Impacts	Negative	Not significant	Localised	Likely	Long-term	Direct

13.7.4 Cumulative Effects

13.7.4.1 Construction Phase

Cumulative construction dust impacts may occur if other large-scale developments within 500 m of the site are under construction simultaneously.

A review of the planned and permitted projects within the last ten years in vicinity of the site was undertaken to identify developments with the potential for cumulative construction phase impacts. There is the potential for the construction phase of the proposed development to coincide with that of the following permitted developments:

- Extension of existing storage warehouse (App. Ref. 2240835);
- Demolition of Uponor building and construction of three-storey primary care centre (App. Ref. 2443027);
- Extension to eastern side of shopping centre (Cork City Council Ref No. 185824)

If these sites were to commence construction at the same time, the cumulative effects will be temporary and slight. Otherwise, no significant cumulative impacts have been identified.

The dust mitigation measures outlined in Section 13.8.1 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development is ***short-term, direct, negative*** and ***not significant***.

13.7.4.2 Operational Phase

Cumulative developments were included in the traffic figures supplied for the operational phase assessment and therefore the cumulative effect is included within the operational stage effect for the proposed development outlined in Section 13.7.2. The effect is predicted to be ***long-term, direct, localised, negative*** and ***not significant*** with regards to air quality.

13.8 Mitigation Measures

13.8.1 Construction Phase Mitigation

The proposed development has been assessed as having a medium risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section 13.7.1). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a medium risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRCC (2022)), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

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Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.
- Measures Specific to Construction
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permit.
- Access gates to be located at least 10 m from receptors where possible.

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Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

13.8.2 Operational Phase Mitigation

No site-specific mitigation measures are proposed for the operational phase as impacts are predicted to be not significant.

13.9 Residual Impact Assessment

13.9.1 Construction Phase

To minimise dust emissions during construction, a series of mitigation measures have been prepared as outlined in Section 13.8. Provided the dust minimisation measures are adhered to, the predicted residual air quality impacts during the construction phase are ***short-term, direct, negative, localised*** and ***not significant***.

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values, which are based on the protection of human health (Table 13-1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is ***short-term, direct, negative, localised*** and ***not significant***.

13.9.2 Operational Phase

The air quality assessment of traffic emissions has looked at specific impacts at receptors external to the site as well as internal proposed residential dwellings and amenity areas within the proposed development site, this was to address the specific request of Cork City Council. The air modelling assessment of operational traffic emissions has shown that predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ with the proposed development in place are in compliance with the relevant ambient air quality limit values which are set for the protection of human health. Therefore, the operational phase effect on air quality and human health as a result of increased traffic is ***long-term, direct, localised*** and ***negative*** which is overall ***not significant*** in EIA terms.

13.9.3 Summary of Post-mitigation Effects

The following table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 13.17 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of construction dust from earthworks, construction and trackout in terms of dust soiling, and human health	Negative	Not significant	Areas within 250m of site as per Section 13.5.3.	Likely	Short-term	Direct
Impact of construction phase traffic on air quality	Neutral	Imperceptible	Rectors within 200m of impacted roads as per Section 13.2.3.	Likely	Short-term	Direct

The following table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 13.18 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of operational phase traffic on air quality	Negative	Not significant	Worst-case receptors within 200m of impacted road links	Likely	Long-term	Direct

13.9.4 Cumulative Residual Effects

The primary potential cumulative residual effect relates to construction dust emissions. According to the IAQM guidance (IAQM, 2024), if the construction phase of the proposed development coincides with the construction phase of any other large scale permitted projects within 500m of the site, there is a possibility of cumulative residual dust effects occurring at any nearby sensitive receptors. Should simultaneous construction phases occur, it would lead to cumulative residual dust soiling and dust-related effects on human health, specifically localised to the works area associated with the proposed works.

However, should the construction phases of the development and any localised permitted developments coincide, it is predicted that once the mitigation measures outlined in Section 13.8.1 are put in place impacts will not be significant. Impacts will be ***short-term, direct, localised, negative*** and ***not significant***. No significant cumulative adverse impacts to air quality are predicted for the construction or operational phases.

13.10 Risk of Major Accidents or Disasters

There are no likely risks of major accidents and disasters in relation to air quality associated with the proposed development due to the nature and scale of the development. The proposed development is residential in nature and will not require large scale quantities of hazardous materials or fuels.

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13.11 Worst Case Scenario

Reasonable worst-case estimates have been used as part of this assessment. As a result, Section 13.9 details the worst-case residual effect of the proposed development.

13.12 Interactions

13.12.1 Air Quality and Population & Human Health

13.12.1.1 Construction Phase

An adverse air quality impact during the construction phase can cause health and dust nuisance issues. There is a low risk of dust-related human health impacts during the construction phase of the proposed development. Best practice mitigation measures will implemented during the construction phase to ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted impact is ***direct, short-term, negative, localised*** and ***not significant*** with respect to Population and Human Health during the construction phase.

13.12.1.2 Operational Phase

Vehicles accessing the site will emit pollutants which may impact Air Quality and Human Health. However, the increased number of vehicles associated with the proposed development will not cause a significant change in air pollutant emissions in the locality. It has been assessed that emissions will be in compliance with the ambient air quality standards which are set for the protection of human health. Impacts will be ***long-term, localised, direct, negative*** and ***not significant***.

13.12.2 Air Quality and Climate

Air Quality and Climate have interactions as the emissions from the burning of fossil fuels during the construction and operational phases generate both air quality and climate impacts. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

13.12.3 Air Quality and Land & Soils

13.12.3.1 Construction Phase

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality and Land & Soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils during the construction phase.

13.12.3.2 Operational Phase

There are no potentially significant interactions identified between Air Quality, and Land & Soils during the operational phase.

13.12.4 Air Quality and Biodiversity

13.12.4.1 Construction Phase

Dust generation can occur during extended dry weather periods due to construction traffic along haul routes and construction activities such as excavations and infilling works. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects. There are no designated ecological sites within 250 m of the proposed development site area. Significant dust impacts are not predicted beyond this distance. Dust mitigation measures will be implemented on site as set out in Section 13.8.1. With the implementation of these mitigation measures dust emissions will be minimised and impacts will be ***direct, short-term, negative, localised*** and ***not significant*** with respect to biodiversity.

13.12.4.2 Operational Phase

There are no potentially significant interactions identified between Air Quality, and Biodiversity during the operational phase.

13.12.5 Air Quality and Material Assets – Traffic & Transport

13.12.5.1 Construction Phase

Interactions between Air Quality and Traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between Traffic and Air Quality are linked but there is no potential for significant impacts from traffic on air quality. The effects are considered to be ***direct, short-term, neutral, localised*** and ***not significant*** during the construction phase.

13.12.5.2 Operational Phase

The impact of the interactions between Traffic and Air Quality are considered to be ***long-term, direct, negative*** and ***not significant*** during the operational phase.

13.13 Monitoring

13.13.1 Construction Phase

The following monitoring measures are proposed to ensure the dust mitigation measures are working satisfactorily:

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German

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Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m2/day during the monitoring period of 30 days (+/- 2 days). Monitoring shall ensure that the dust mitigation measures are working satisfactorily as construction works progress.

13.13.2 Operational Phase

There is no monitoring recommended for the operational phase of the proposed development as impacts to air quality are predicted to be imperceptible.

13.14 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 13.19 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Quality	Significance
Impact of construction dust from demolition, earthworks, construction and trackout in terms of dust soiling and human health	Dust control measures as per IAQM Guidance (IAQM, 2024) and Section 13.8.1.	Monitoring of construction dust deposition as per Section 13.13.1.

The following table summarises the Operational Phase mitigation and monitoring measures.

Table 13.20 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Quality	Significance
No mitigation or monitoring required for the operational phase of the development as impacts to air quality are predicted to be not significant.		

13.15 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to air quality. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter, the overall predicted effect of the proposed development is ***not significant***.

13.16 References and Sources

BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites

Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

Environmental Protection Agency (2024) Air Quality in Ireland 2023 (& previous annual reports)

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

Government of Ireland (2023) Clean Air Strategy for Ireland

Institute of Air Quality Management (IAQM) (2020) A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1)

Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2)

Met Éireann (2025) Met Éireann website: https://www.met.ie/

The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

Transport Infrastructure Ireland (2022) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

Transport Infrastructure Ireland (2025) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2021) Air Quality Guidelines (and previous Air Quality Guideline Reports 1999 & 2000 & 2006)

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CHAPTER FOURTEEN

CLIMATE

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CHAPTER 14 | Climate

14.1 Introduction

This chapter assesses the likely climate impacts associated with the proposed Bridgewater largescale residential development located southwest of Cork City, at Ardarostig, Bishopstown, Cork. A full description of the development is available in Chapter 2.

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

14.2 Expertise & Qualifications

This chapter was completed by Tanmay Gojamgunde. Tanmay is an environmental consultant in the Air Quality & Climate section of AWN Consulting, a Trinity Consultants Company. He holds a MSc in Air Pollution Management and Control from the University of Birmingham and has also completed BTech in Environmental Engineering. As part of the MSc, he worked on 'The Impact of bus-fleet electrification on air quality in Birmingham' utilising advanced dispersion modelling tools and emission inventory toolkit. Prior to joining AWN, Tanmay contributed to several key environmental projects in India, including Delhi's first air quality monitoring program (R ASMAN), air quality and traffic planning assessments with IIT Kanpur, and an Environmental Impact Assessment Report (EIAR) for an industrial district in Kanpur. He also specialises in conducting air dispersion modelling assessments of emissions, emission inventories, R programming and extends to broader aspects of environmental engineering.

This chapter was reviewed by Ciara Nolan. Ciara is a principal environmental consultant in the Air Quality & Climate section of AWN Consulting. She holds a BSc in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is a Member of the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Sciences (MIEnvSc). She has over 8 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for residential developments including Woodbrook, Shankill (Planning Application Ref. ABP30584419), Ballygossan Park, Skerries (Planning Application Ref. LRD0010/S3), SHD Ratoath (Planning Application Ref. SH305196), SHD Rathmullen, Drogheda (Planning Application Ref. SH305552), commercial and industrial developments by Dublin Airport Authority, Abbvie, Mountpark, Pfizer, Takeda, as well as renewable energy developments such as Crockahenny Windfarm, Upperchurch Windfarm, Knocknamona Windfarm and Keerglen Windfarm. She also specialises in conducting air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Echelon DC, AWS, Takeda, MSD and Regeneron. She has undertaken air quality and climate impact assessments for transportation schemes, primarily regional and national road schemes, from constraints, through to route selection and EIAR stage.

14.2.1 Aspects Relevant to this Assessment

During the construction phase engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO_2 and to a lesser extent, other greenhouse gases (GHGs). Embodied carbon of materials used in the construction of the development along with site activities will impact climate. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

Engine emissions from vehicles accessing the site have the potential to impact climate during the operational phase of the development through the release of CO_2. Operational phase impacts will be long-term in duration. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase.

14.3 Methodology

14.3.1 Relevant Guidance, Legislation & Policy

14.3.1.1 Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on climate are summarised below. In addition to specific climate guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022); and
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).

The assessment has referred to national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2024);
- Institute of Sustainability and Environmental Professionals (ISEF) (formerly known as Institute of Environmental Management & Assessment (IEMA)) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the ISEF 2022 GHG Guidance) (ISEF, 2022);
- ISEF Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the ISEF 2020 EIA Guide) (ISEF, 2020a);
- ISEF GHG Management Hierarchy (hereafter referred to as the ISEF 2020 GHG Management Hierarchy) (ISEF, 2020b);
- ISEF Principles Series: Climate Change Mitigation & EIA (ISEF, 2010);
- Carbon Management in Infrastructure and Built Environment - PAS 2080 (BSI, 2023); and
- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a).

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14.3.1.2 Legislation

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 2015 Act). The purpose of the 2015 Act was to enable Ireland *"to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050"* (3.(1) of No. 46 of 2015). This is referred to in the 2015 Act as the 'National Transition Objective'. The 2015 Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the 2015 Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022) with an Annex of Action published in March 2023. The current Climate Action Plan is CAP25, published in March 2025 (Government of Ireland, 2025).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act) in March 2021. The Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021) is to provide for the approval of plans "*for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050*". The 2021 Climate Act also provides for "*carbon budgets and a decarbonisation target range for certain sectors of the economy*". The 2021 Climate Act defines the carbon budget as "*the total amount of greenhouse gas emissions that are permitted during the budget period*".

In relation to carbon budgets, the 2015 Act (as amended) states *"a carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'Budget Period')*'. The carbon budget is to be produced for 3 sequential budget periods (Table 14.1). The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period, and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published in the Climate Action Plan 2024 (CAP24) (Government of Ireland, 2023a) (Table 14.2).

Table 14.1 5-Year Carbon Budgets

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO_2e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 14.2 Sectoral Emission Ceilings 2030

Sector	Baseline ($MtCO_2e$)	Carbon Budgets ($MtCO_2e$)		2030 Emissions ($MtCO_2e$)	Indicative Emissions % Reduction in Final Year of 2025 – 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment – Residential	7	29	23	4	40
Built Environment – Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP24 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
Total	68				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

14.3.1.3 Policy

14.3.1.3.1 Greenhouse Gas Assessment Policy

In 2024, the Government published its Long-Term Strategy on Greenhouse Gas Emissions Reductions (Government of Ireland, 2024). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the CAP.

In December 2023, CAP24 was published, establishing key actions to deliver a 51% reduction in GHG emissions by 2030 (compared to 2018 levels) and achieve climate neutrality by 2050 (Government of Ireland, 2023a). The updated and current CAP25, published in April 2025, builds on the progress of the previous four iterations of the CAP, with CAP23 first publishing carbon budgets and sectoral emission ceilings, and reaffirms Ireland's climate ambition, with a focus on delivery, implementation and measurable outcomes, particularly ahead of the second carbon budget period (2026–2030). 2025 is the last year in the first 5-year carbon budget period. During the initial 5-year budget period the average annual reduction required was 4.8%, this

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increases to 8.3% in the second budget period (2026-2030). CAP25 retains the high-impact sectors where the biggest savings can be achieved, while emphasising public sector leadership and green procurement. These sectors include renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and land-use change.

CAP25 also includes targeted actions to decarbonise industrial heat and support the transition to carbon-neutral manufacturing processes. Public sector leadership is strengthened through a new Buying Greener: Green Public Procurement Strategy and Action Plan (2024–2027), the development of mandatory Climate Action Roadmaps, and enhanced emissions monitoring and reporting across government operations. To support innovation and ensure future economic resilience, IDA Ireland continues to attract and support businesses investing in climate technologies and low-carbon solutions.

CAP25 highlights a significant 17% reduction in electricity emissions in early 2024, with wind power supplying nearly 40% of Ireland's total electricity demand and over 100,000 rooftop microgenerators connected to the grid. Investments are ongoing in grid reinforcement, offshore wind development, and interconnectors with France and the UK to enhance renewable generation capacity. EirGrid, Enterprise Ireland and IDA Ireland have recently signed an MoU to collectively support offshore wind development in Ireland.

CAP25 also reinforces targets first outlined in CAP24 to reduce the embodied carbon of construction materials, with a 10% reduction by 2025 and 30% reduction by 2030 for materials produced and used in Ireland. Cement and high embodied carbon construction materials can be reduced through product substitution, reduced clinker content in cement and uptake of low-carbon construction methods, including those outlined in the Construction Industry Federation 2021 report Modern Methods of Construction (Construction Industry Federation, 2021). There also remains scope for the construction industry to use more timber in construction. In 2022, 24% of new construction in Ireland was built using timber frames to satisfy the demand for housing. Public bodies are now required under the Public Sector Mandate to use best practice project design to reduce embodied carbon; procure concretes with clinker replacements (lower carbon); and require that large construction projects produce a whole life cycle GHG emissions assessment.

Furthermore, CAP25 advances sector-specific measures in green procurement, electrification of transport and heat, and just transition (with the introduction of a Just Transition Commission) to support vulnerable communities. Transport emissions increased by 0.3%. Electric vehicles and the use of biofuels are stated as the best means of transport emission reductions in the medium term.

The *Cork City Council (CCC) Climate Action Plan 2024-2028* (CCC, 2024) outlines the Council's commitment to achieving significant reductions in GHG emissions while preparing for the impacts of climate change. The plan is informed by Cork's participation in the EU Mission for Climate-Neutral and Smart Cities, which sets ambitious goals, including a transition to net-zero emissions by 2030.

A key focus of the Cork City Climate Action Plan is to reduce car dependency by promoting a shift towards more sustainable modes of transport, such as active travel (walking and cycling), and expanding the public transport network. The Council also plans to work with relevant transportation bodies to introduce these measures, like the approach adopted by the National Climate Action Plan.

14.3.1.3.2 Climate Change Vulnerability Policy

The second National Adaptation Framework (NAF) (DECC, 2024) was published in June 2024 in line the five-year requirement of the 2015 Climate and Low Carbon Development Act. The plan provides a whole of government and society approach to climate adaptation in Ireland to reduce Irelands vulnerability to climate change risks including extreme weather events, flooding, drought, loss of biodiversity, sea level rise and increased temperatures. Similar to the *"Just Transition"* when considering carbon emissions, the NAF aims for *"Just Resilience"* stating that *"a climate resilient Ireland will have a reduced reliance on fossil fuel, it will have widely accessible electrified public transport and will have transitioned towards sustainable agricultural practices such as agroforestry and organic farming"*.

In relation to the built environment the NAF states, in Chapter 3, "*deepening of adaptation considerations in the planning and building standards processes is considered the most appropriate way of increasing the resilience of the built environment*". Within the NAF it mentions that there is a risk of damage to buildings and structures from severe weather events such as high winds and intense rainfall. New development should accommodate predicted future climate change impacts without requiring major redesign or redevelopment in the future which may be costly and inefficient. This will require facilitating innovative building design, new materials and standards (to accommodate hotter summers while withstanding changes in precipitation patterns and more intense storms for example) according to the NAF (DECC, 2024).

The National Climate Change Risk Assessment (NCCRA) was published in May 2024 (EPA, 2024b). The NCCRA was required to be developed under Action 457 from the 2021 CAP (Government of Ireland 2021). Action 457 seeks to "f*urther develop Ireland's national climate change risk assessment capacity to identify the priority physical risks of climate change to Ireland"*. The NCCRA uses definitions of the risk determinants from the Intergovernmental Panel on Climate Change (IPCC) Risk Framework (IPCC 2023):

- **Hazard** - the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources
- **Exposure** - the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected
- **Vulnerability** - the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity
- **Risk** - the potential for adverse consequences for human or ecological systems.

When considering risk, the NCCRA assesses exposure and vulnerability for two future climate change scenarios or Representative Concentration Pathways (RCPs):

- RCP4.5 was selected as it represents a scenario aligned with the global temperature trajectory
- RCP8.5 was selected as it represents a high-emissions scenario and achieves the highest level of modelled temperature increases by the end of the century. Consequently, this scenario will result in the highest level of physical risk for Ireland, and the greatest requirement for adaptation.

These scenarios align with a conservative approach to assess risks to Ireland and assumes global emission reduction targets are not met. This aligns with the principle of precaution as stated in the NAF (DECC 2024). In addition to the future climate scenarios, the NCCRA assesses the risk from the future climate during the following timeframes:

- Present (~2030)
- Medium term (~2050)
- Long term (~2100).

The *Cork City Climate Action Plan 2024-2028* highlights the increasing risks posed by climate change to the city's infrastructure, residents, and businesses, particularly from extreme weather events such as flooding, heatwaves, and droughts. Pluvial, fluvial, and coastal flooding are identified as significant risks due to rising sea levels and more intense rainfall events. Without mitigation, these events are projected to lead to the inundation of properties, damage to infrastructure, and disruptions to transport networks.

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Flood-relief measures, including both engineered and nature-based solutions, such as Sustainable Urban Drainage Systems (SuDS), have been incorporated into city planning. Recent and ongoing works, including those in Togher, Douglas, and the Lower Lee flood protection schemes, will enhance Cork's resilience to future flooding risks.

14.3.2 Greenhouse Gas Assessment

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 14.5.1).

14.3.2.1 Construction Phase

The GHG assessment accounts for various components relating to the project during different life stages to determine the total impact of the development on climate. The reference study period (i.e. the assumed building life expectancy) for the purposes of the assessment is 60 years. Embodied carbon emissions are attributed to four main categories, taken from BS EN 15978. The categories are:

- **Product Stages (Category A1 to A3)** The carbon emissions generated at this stage arise from extracting the raw materials from the ground, their transport to a point of manufacture and then the primary energy used (and the associated carbon impacts that arise) from transforming the raw materials into construction products.
- **Construction (Category A4 to A5)** These carbon impacts arise from transporting the construction products to site, and their subsequent processing and assembly into the building.
- **Use Stage (Category B1 to B7)** This covers a wide range of sources from the GHG emissions associated with the operation of the building (B1), maintenance (B2), repair (B3), refurbishment (B4) and replacement (B5) of materials, and operational energy use (B6) and water use (B7).
- **End of Life Stages (Category C1 to C4)** The eventual deconstruction and disposal of the existing building at the end of its life takes account of the on-site activities of the demolition contractors. No “credit” is taken for any future carbon benefit associated with the reuse or recycling of a material into new products.

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2024) or an appropriate alternative tool. Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The purpose of the embodied carbon assessment is to engage the design team in the consideration of embodied carbon at an early stage in the development and mitigate embodied carbon. This engagement aims to ensure carbon savings are made and to assist in aligning the project to Ireland’s CAP goal of Net Carbon Zero by 2050.

The TII Online Carbon Tool (TII, 2024) has been commissioned by TII to assess GHG emissions associated with road or rail projects in Ireland. The TII Carbon Tool (TII, 2024) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013), which can be applied to a variety of developments, not just road or rail. The tool aligns with PAS 2080.

For the building elements of the proposed development, the OneClick LCA 3D Designer tool was utilised. OneClick LCA is certified to EN 15978, EN 15978, ISO 21931 – 1 & ISO 21929, and data requirements of ISO 14040 & EN 15804, and is LEED, BREEAM and PAS 2080 aligned. It allows users to assess the carbon impact of buildings at various stages of design. The tool includes a detailed product and material list based on Irish materials as well as materials from the UK and Europe. The OncClick LCA 3D Designer option allows for a high-level assessment of the embodied carbon impact of a development at early design stages when specific detailed design information is not know and is suitable for EIAR stage assessments.

Inputs into the tool include gross floor areas for the building types (houses/duplexes/apartments), building frame type, number of above ground floors and building size and shape. The tool then makes necessary default assumptions based on these parameters and a typical build-up with the option to refine the default assumptions where project specific information is available. The tool allows for optioneering and optimization of the carbon impact, it highlights the key areas within the building with the highest carbon impact and provides options for lower carbon intensive materials.

The TII Carbon Tool was utilised to estimate the GHG emissions associated with the non-building elements of the proposed development including construction activities, land clearance activities and construction wastes.

Reasonable conservative estimates have been used in this assessment where necessary to provide an estimate of the GHGs associated with the proposed development.

14.3.2.2 Operational Phase

14.3.2.2.1 Traffic Emissions

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO_2) which will impact climate.

The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022b), states that road links meeting one or more of the following criteria can be defined as being ‘affected’ by a proposed development and should be included in the local air quality assessment, and also the climate assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5 m or greater.

While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

There are a small number of road links that will experience a change of over 1,000 in the AADT during the operational phase due to the proposed development. As a result, a detailed assessment of traffic related carbon dioxide (CO_2) emissions was conducted.

PE-ENV-01104 (TII, 2022a) states that road traffic related emissions information should be calculated using the TII Road Emissions Model (REM) online calculator tool (TII, 2025). The TII guidance (TII, 2022b) states that modelling should be conducted for the Base, Opening and Design Years for both the Do Nothing and Do Something scenarios. The output is provided in terms of CO_2e.

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy-duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The *Default* fleet mix option was selected along with the *Intermediate Case* fleet data base selection for cars, the *ICE Sales Ban 2035* fleet data base for LGVs and the *EU Target* for the HGV fleet data base, as per TII Guidance (TII, 2025). The Intermediate Case assumes a linear interpolation between the

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Business-as-Usual case – where current trends in vehicle ownership continue and the Climate Action Plan (CAP) case – where adoption of low emission light duty vehicles occurs. The ICE Sales Ban 2035 represents a sales ban on new combustion engine vehicles to be implemented by 2035, and the EU Target for HGV represents interim targets for emissions from sales of new HGVs.

Traffic flow information was obtained from MHL Consulting Engineers, the traffic engineers, for the purposes of this assessment. Data was provided for the Base Year 2025, Opening Year 2027 and Design Year 2042 (see Traffic and Transport Assessment for further details). Both the Do Nothing and Do Something scenarios are quantified to determine the degree of change in emissions due to the proposed development. A total of 2 no. scenarios were assessed, these include:

- The Do Nothing scenario – this scenario assumes the proposed development is not in place in future years but includes traffic associated with cumulative developments in the wider area.
- The Proposed scenario – this is the "Do Something" scenario and includes traffic from the Do Nothing scenario and traffic associated with the proposed development as well as traffic associated with cumulative developments in the wider area.

Further detail on the modelling scenarios can be found in the Traffic and Transport Assessment prepared by MHL Consulting Engineers and submitted with this planning application. The traffic data is detailed in Table 14.3. Only road links that met the TII scoping criteria were included in the modelling assessment. Inputs include light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy-duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type and project county location.

Table 14.3 Traffic Data used in Operational Phase Climate Assessment

Road Name	Speed (kph)	Base Year	Opening Year		Design Year	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Development Road	30	1538 (31)	1538 (31)	3548 (72)	1538 (31)	3548 (72)
Waterfall Road J1-J2	50	5860 (181)	8035 (248)	9731 (301)	9100 (281)	10785 (334)
Waterfall Road J2-J3	50	5657 (115)	7436 (152)	8755 (179)	8469 (173)	9776 (200)
Waterfall Road J3-J4	50	5795 (179)	7611 (235)	8915 (276)	8665 (268)	9959 (308)
N40 section	100	47851 (1582)	47851 (1582)	47851 (1582)	47851 (1582)	47851 (1582)

14.3.2.2.2 Operational Phase Energy Use

The EU guidance (European Commission, 2013) also states indirect GHG emissions as a result of a development must be considered, which includes emissions associated with energy usage. Information on the proposed energy strategy for the development was obtained from the Climate Action and Energy Statement and used to inform this assessment. Several measures in relation to sustainable energy usage have been incorporated into the overall design of the development which will have the benefit of reducing the impact to climate where possible during operation.

14.3.2.3 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII, 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on ISEF guidance (ISEF, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA document *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

The 2022 ISEF Guidance (ISEF, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. Therefore, the significance of a project's emissions should be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended TII significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII 2022a) states that professional judgement must be considered when contextualising and assessing the significance of a project's GHG impact. TII reference the ISEF guidance (ISEF, 2022) which states that the crux of assessing significance is *"not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".*

Significance is determined using the criteria outlined in Table 14.4 (derived from Table 6.7 of PE-ENV-01104 (TII 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

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Table 14.4 Significance Criteria for GHGA

Effects	Significance Level	Description
Significant Adverse	Major Adverse	• The project's GHG impacts are not mitigated. • The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and • No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate Adverse	• The project's GHG impacts are partially mitigated. • The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and • Falls short of full contribution to Ireland's trajectory towards net zero.
Not Significant	Minor Adverse	• The project's GHG impacts are mitigated through 'good practice' measures. • The project has complied with existing and emerging policy requirements; and • Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	• The project's GHG impacts are mitigated beyond design standards. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	• The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

Ireland's carbon budgets can also be used to contextualise the magnitude of GHG emissions from the proposed development (TII, 2022a). The approach is based on comparing the net proposed development GHG emissions to the relevant carbon budgets (Government of Ireland, 2023a). With the publication of the Climate Action Act in 2021 and the Climate Action Plan 2025, sectoral carbon budgets have been published for comparison with the net GHG emissions from the proposed development over its lifespan. The aim of the carbon budgets is to ensure we are on a trajectory to meet the National Climate Objective of Net Zero by 2050.

14.3.3 Climate Change Risk Assessment

The assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (ISEF, 2020).

The baseline environment information provided in Section 14.5, future climate change modelling and input from other experts working on the proposed development (i.e. hydrologists) should be used to assess the likelihood of a climate risk.

First an initial screening CCRA based on the operational phase is carried out, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of proposed development assets (i.e. receptors) and their exposure to climate change hazards.

The proposed development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provides the list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development-by-development basis.

- **Asset Categories:** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards:** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity:** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity:** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2**.**
- **Low Sensitivity:** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type. For example, flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure:** It is almost certain or likely this climate hazard will occur at the project location, i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure:** It is possible this climate hazard will occur at the project location, i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure:** It is unlikely or rare this climate hazard will occur at the project location, i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability.

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14.3.3.1 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account. Table 14.5 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. Therefore, the impact from climate change on the proposed development is not significant.

However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks. An assessment of construction phase CCRA impacts is only required according to the TII guidance (TII, 2022a) if a detailed CCRA is required.

Table 14.5 Vulnerability Matrix

		Exposure		
		High (3)	**Medium (2)**	**Low (1)**
Sensitivity	**High (3)**	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

The screening CCRA, detailed in Section 14.7.2.2, did not identify any residual medium or high risks to the proposed development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 14.8.

14.3.4 Site Surveys/Investigations

No surveys were required as part of the climate assessment.

14.3.5 Consultation

An S.247 meeting was held with Cork City Council on 03.03.2025 and an LRD meeting on 13.06.2025. The Council issued an Opinion document following the meetings. As part of the Opinion the EIA is to demonstrate how climate change has been considered as part of the proposed development. Section 14.7.2 includes an assessment of the vulnerability of the proposed development to climate change and how necessary design mitigation measures have been implemented to ensure all risks are classified as 'low'. Additionally, a Climate Action Energy Statement has been prepared by OSL Butler Consulting Engineers and was reviewed and used to inform the climate assessment within this EIAR chapter, particularly regarding the proposed energy use strategy for the development.

14.4 Difficulties Encountered

There were no difficulties encountered in compiling this assessment.

14.5 Baseline Environment

PE-ENV-01104 (TII, 2022a) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

Climate impacts are assessed at a national level and in relation to national targets and sectoral emission ceilings. The study area for climate is the Republic of Ireland and the baseline is determined in relation to this study area.

14.5.1 Current GHG Baseline

Data published in July 2025 (EPA, 2025a), indicates that Ireland exceeded, without the use of flexibilities, its 2024 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 1.03 $MtCO_2e$. However, the 2024 emissions represent the second consecutive year in which Ireland's emission were below (-4.2%) 1990 levels. ETS (Emissions Trading Scheme) emissions decreased (-7.4%) and ESR (Effort Sharing Regulation) emissions decreased (-0.5%). Ireland's target is an emission reduction of 626 kt of CO_2e by 2030 on an average baseline of 2016 to 2018.

The EPA estimate that 2024 total national GHG emissions, excluding LULUCF, have decreased by 2.0% on 2023 levels to 53.75 Mt CO_2e, with a 0.7 Mt CO_2e (-8.9%) reduction in electricity industries alone. This was driven by a 39.6% share of energy from renewables in 2024 and the complete phase-out of peat for electricity generation. Manufacturing combustion and industrial processes decreased by 4.6% to 6.0 Mt CO_2e in 2024 due to declines in fossil fuel usage. The sector with the highest emissions in 2024 was agriculture at 38% of the total, followed by transport at 21.7%. For 2024, total national emissions (including LULUCF) were 57.64 Mt CO_2e (EPA, 2025a) (Table 14.6).

The current estimates of National greenhouse gas emissions (including LULUCF) in 2024 are 12.0% below 2018, well off the National Climate ambition of a 51% reduction by 2030. The data indicate that from 2021- 2024 Ireland has used 82.5% of the 295 Mt CO_2e Carbon Budget for the five-year period 2021-2025. This leaves 17.5% of the budget available for 2025, requiring a substantial 10.3% annual emissions reduction for 2025 to stay within budget.

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Table 14.6 Trends in Total National GHG Emissions 2021 – 2023

Sector [Note 1]	2021	2022	2023	2024	Total Budget (Mt CO_2e) (2021-2025)	% Budget 2021-2025 Used	Annual Change 2023 to 2024
Electricity	9.89	9.69	7.57	6.95	40	85.25%	-8.19%
Transport	11.09	11.76	11.80	11.65	54	85.74%	-1.27%
Buildings (Residential)	6.87	5.75	5.35	5.61	29	81.31%	4.86%
Buildings (Commercial and Public)	1.44	1.45	1.39	1.49	7	82.43%	7.19%
Industry	7.09	6.62	6.31	6.01	30	86.77%	-4.75%
Agriculture	21.94	21.78	20.72	20.41	106	80.05%	-1.50%
Other [Note 2]	1.86	1.93	1.81	1.63	9	80.33%	-9.94%
LULUCF	4.63	3.98	3.89	3.89	–	–	0
Total including LULUCF	64.82	62.99	58.83	57.64	295	82.81%	-2.04%

Note 1 Reproduced from latest emissions data on the EPA website July 2025 (EPA, 2025).

Note 2 Other includes Petroleum refining, F-Gases and Waste (emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste).

14.5.2 Future GHG Baseline

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022a) and ISEF Guidance (ISEF, 2022) the future baseline is a trajectory towards net zero by 2050, "*whether it* [the project] *contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

The future baseline will be determined by Ireland meeting its targets set out in the CAP25, and future CAPs, alongside binding 2030 EU targets. The European Union (EU) enacted *'Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013'* (hereafter referred to as the Regulation) (European Union, 2018) to meet the commitments under the Paris Agreement. The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its ETS and non-ETS greenhouse gas emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and includes GHG emissions from transport, residential and commercial buildings and agriculture.

In May 2025, the EPA released the report Ireland's Greenhouse Gas Emissions Projections 2024-2055 (EPA, 2025), which includes total projected emissions and a breakdown of projected emissions per sector under the 'With Existing Measures' and 'With Additional Measures' scenarios. The EPA projections indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

14.5.3 Current CCRA Baseline

The region of the proposed development has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Cork Airport is the nearest, representative, weather and climate monitoring station to the proposed development with meteorological data recorded for the 30-year period from 1991 to 2020. The historical regional weather data for Cork Airport metrological station is representative of the current climate in the region of the proposed development. The data for the 30-year period from 1991 to 2020 indicates that the wettest months at Cork Airport Metrological Station were January, October and December, and the driest month on average was May (Met Éireann, 2025a). July was the warmest month with a mean temperature of 15.2 Celsius. January was the coldest month with a mean temperature of 5.7 Celsius.

Met Éireann's 2023 Climate Statement (Met Éireann, 2024a) states 2023's average shaded air temperature in Ireland is provisionally 11.20°C, which is 1.65°C above the 1961-1990 long-term average. Before this, 2022 was the warmest year on record; however, 2023 was 0.38°C warmer (see Figure 14.1).

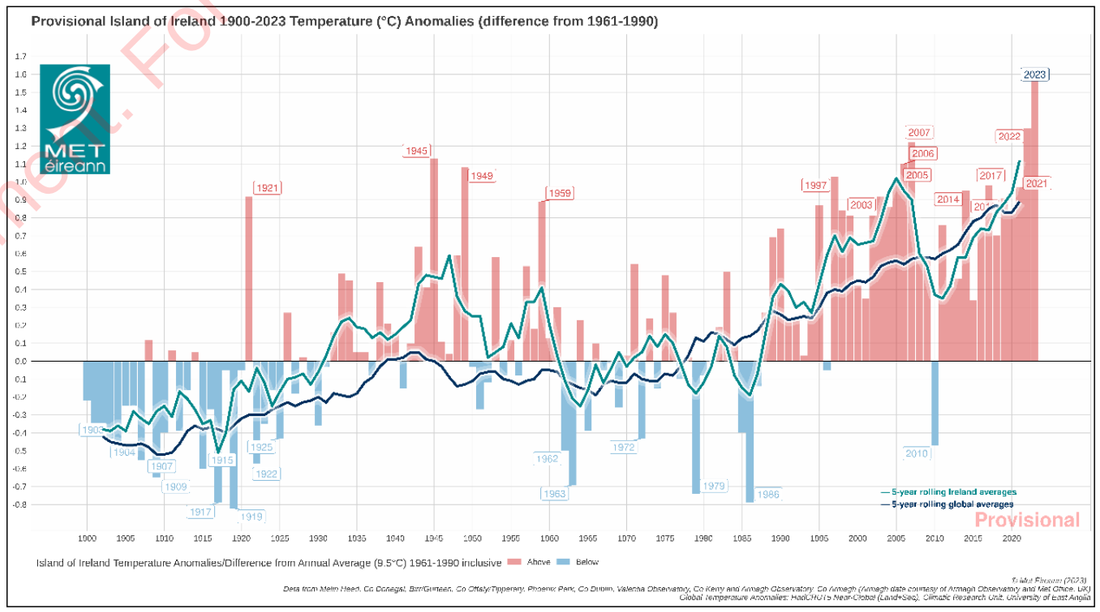


Figure 14.1 1900-2023 Temperature (°C) Temperature Anomalies (differences from 1961-1990)

2023 also had above average rainfall, this included the warmest June on record and the wettest March and July on record. Record high sea surface temperatures (SST) were recorded since April 2023 which included a severe marine heatwave to the west of Ireland during the June 2023. This marine heatwave contributed to the record rainfall in July.

Met Éireann's 2024 *Climate Statement* (Met Éireann 2025b) states 2024's average shaded air temperature in Ireland is provisionally 10.72°C, which is 1.17°C above the 1961-1990 long-term average or 0.55°C above the most recent 1991-2020 long-term average. This is the 4th warmest year on record with 2023 breaking previous records. Seven of the top ten warmest

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years have occurred since 2005. Record high sea surface temperatures (SST) were recorded in 2022, and in 2024 continued at or near record high levels. 2024 was overall drier than average, however there were many instances of heavy or intense rainfall which led to flooding events. This trend is predicted to continue with climate change with an increase in both dry periods and heavy rainfall events. Considering the extraordinary data, Met Éireann states that the latest Irish climate change projections indicate further warming in the future, including warmer winters. The record temperatures mean the likelihood of extreme weather events occurring has increased. This will result in longer dry periods and heavy rainfall events. Storm surges and coastal flooding due to sea level rise. Compound events, where coastal surges and extreme rainfall events occur simultaneously will also increase. Met Éireann has high confidence in maximum rainfall rates increasing but not in how the frequency or intensity of storms will change with climate change.

14.5.4 Future CCRA Baseline

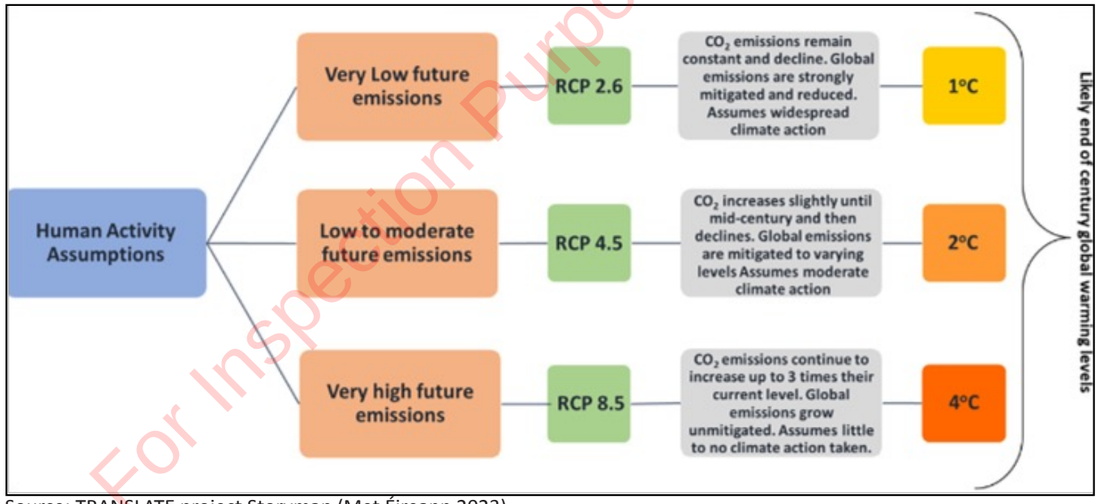
Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed development (EPA, 2021b):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

TII's Guidance document PE-ENV-01104 (TII 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate, while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE (Met Éireann, 2023b) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for "least" (RCP2.6), "more" (RCP4.5) or "most" (RCP8.5) climate change, see Figure 14.2.

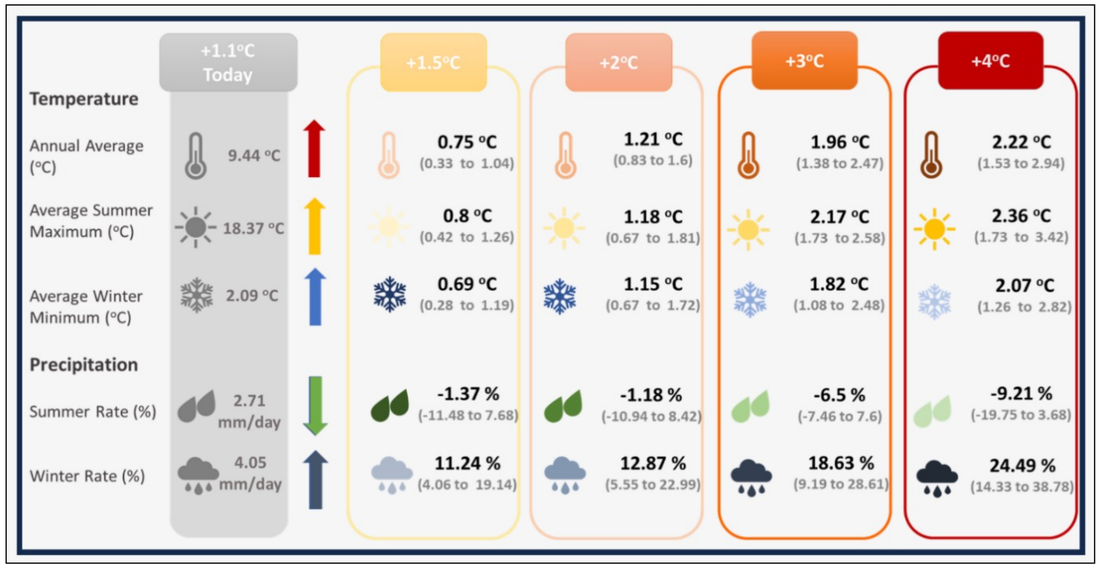


Source: TRANSLATE project Storymap (Met Éireann 2023)

Figure 14.2 Representative Concentration Pathways associated emission levels

TRANSLATE (Met Éireann, 2023b) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5˚C, 2˚C, 2.5˚C, 3˚C or 4˚C. Projections broadly agree with previous projections for Ireland. Ireland's climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30 – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SSTs) (Met Éireann, 2023b). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland's temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24% (see Figure 14.3). Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.

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Source: TRANSLATE project Storymap (Met Éireann, 2023b)

Figure 14.3 Change of climate variables for Ireland for different Global warming thresholds

The TRANSLATE research report (Met Éireann, 2024d) finds that night-time temperatures will warm more than day-time temperatures, with temperatures increases across all seasons but the highest in the summer (with an increase of 0.5°C to 3.5°C). Autumn is projected to have the highest increase in average minimum temperatures (with an increase of 1.1°C to 4.4°C). The variance is dependent on the scenario that is being reviewed. While these temperatures are projected across all of Ireland, they increase most in the east of the country compared to the west. With respect to rainfall, increases of 4% to 38% are projected, however this will not be spread across the year as during summer months there are projected decreases in rainfall beyond the 2°C warming scenario.

In January 2024 the EPA published *Ireland's Climate Change Assessment Synthesis Report* (EPA, 2024c) which contained four volumes:

- Volume 1: Climate Science: Ireland in a Changing World
- Volume 2: Achieving Climate Neutrality by 2050
- Volume 3: Being Prepared for Ireland's Future Climate
- Volume 4: Realising the Benefits of Transition and Transformation

This report reinforces the existing and future risks arising from climate change. Volume 1 (EPA, 2024c) states that under Early action, the temperature increase averaged across the island of Ireland relative to the recent past (1976 to 2005) would reach 0.91°C (0.44 to 1.10°C) by mid-century before falling back to 0.80°C (0.34 to 1.07°C) at the end of the century. Whereas under Late action, by the end of the century it is projected that the temperature increases could be 2.77°C (2.02 to 3.49°C). Heat extremes will become more frequent and more severe and cold extremes will become less frequent and less severe with further warming.

Precipitation was 7% higher over the period 1991 to 2020 than over the 1961 to 1990 period. The average future predicted increase in precipitation is <10% in annual mean accumulated. By 2100 projected additional rises in sea level range from 0.32 to 0.6m under early action to 0.63 to 1.01m under late action scenarios, with greater storm surges potentially effecting critical infrastructure along the coastline. Projections of changes in storminess are highly uncertain and translate into large uncertainties in future frequency and intensity of extreme waves.

Volume 3 (EPA, 2024c) discusses how water supplies will face growing pressures resulting in increased water demand and how options need to be developed, including potential new sources. The report states the key role of critical infrastructure for delivering public services, economic development and a sustainable environment. These are exposed to a range of climate extremes. Failures in critical infrastructure can cascade across other sectors and present a multi-sector risk due to climate change.

The report references the EPA's *Critical Infrastructure Vulnerability to Climate Change* report (EPA, 2021a) as the most substantial research project in Ireland to date on climate change and critical infrastructure which assesses the future performance of Ireland's critical infrastructure when climate is considered. The Critical Infrastructure Vulnerability to Climate Change report states with respect to water availability and quality, that flood risk and heatwaves have a medium vulnerability index and the underground supply network has a high vulnerability to snowstorms and cold spells. However, while the vulnerability is high, the exposure is likely to reduce due to future climate change resulting in less cold weather events. The risk assessment highlights the co-dependence of the water sector to the energy sector, and how vulnerability in the energy sector may have cascading impacts.

Volume 4 (EPA, 2024c) calls for system change, including a transformation of urban settings. Stating that meaningful urban transformation can create a better living environment while simultaneously reducing emissions.

The projections were echoed by the *Updated High-resolution Climate Projections for Ireland Research Report: 471* (EPA, 2024d) which was in broad agreement with previous research. The future autumn and winter months are projected to be up to 10% wetter, while summer is projected to be up to 8% drier.

14.6 The 'Do Nothing' Scenario

In the Do-Nothing scenario, the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

As the site is zoned for development, it is likely that in the absence of the proposed development a development of a similar nature would occur. Therefore, the predicted climate impacts within this report are likely to occur even in the absence of the proposed development.

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14.7 Potential Significant Effects

14.7.1 Greenhouse Gas Assessment

14.7.1.1 Construction Phase

The most significant proportion of GHG emissions tend to occur during the construction phase due to embodied carbon in construction materials and emissions from construction activities. Therefore, the assessment has been included in the construction phase assessment for the purposes of the EIAR. The assessment is broken down into the following stages as per Section 14.3.2.1

- Product stage (A1 – A3);
- Transportation to site (A4);
- Site operations (construction activities) (A5); and
- Material replacement & refurbishment (B4 – B5).

The construction phase GHG emissions comprise stages A1 – A5 which includes the construction materials, the transport of the materials to site and the construction activities or site operations. Ongoing material refurbishment and replacement throughout the lifetime of the development is included within category B4 – B5, these are default values based on the typical maintenance requirements for the chosen material types over the assumed 60-year lifetime.

The carbon assessment highlights the areas where the highest embodied carbon emissions occur, specifically as a result of building materials based on a typical build-up for the building type (house; duplex; apartment, etc.).

The GHG emissions from the development as a total cannot be compared against one specific sector 2030 carbon budget. The emissions are broken down into different assessment categories and these must be compared separately to the relevant sectoral emissions budgets, which are detailed in Table 14.7. The relevant sectoral emissions for the proposed development comparison include the Industry sector, Transport sector, and Waste sector. The predicted emissions for the proposed development are annualised over the assumed 60-year lifespan and then compared to the relevant sector 2030 carbon budgets. Annualising the full carbon emissions over the lifetime of the development allows for appropriate comparison with annual GHG targets.

The results of the GHGA are shown in Table 14.7. This includes both the outputs from the OneClick LCA tool and the TII Carbon Tool. Construction materials make up the majority of GHG emissions for the proposed development, accounting for approximately 80% of the total construction phase GHG emissions. Material replacement makes up the second highest contribution at 17% of the total. Material transport, waste and construction activities make up the remainder of the construction GHG emissions. The A5 and B4-B5 categories include carbon savings associated with waste material recycling or re-use.

It has been calculated that the total construction phase embodied carbon (including maintenance and replacement of materials over the development lifetime) for the proposed development will be 19,924 tonnes CO_2e (see Table 14.7).

Table 14.7 GHG Assessment Results

Stage	GHG Assessment Category	Predicted GHG Emissions (tCO_2e)	Predicted GHG Emissions as % of Project Total	Relevant Sector for Carbon Budget Comparison
A1-A3	Materials	15,963	80%	Industry
A4	Material Transport	304	2%	Transport
A5	Site Clearance and Demolition	3	0.01%	Industry
	Construction site material waste	44	0.22%	Waste
	Construction site material waste transport	5	0.02%	Transport
	Construction site waste	-41	-0.21%	Waste
B4 - B5	Maintenance Material	3,333	17%	Industry
	Maintenance Material Transport	9	0.04%	Transport
	Maintenance Material Waste	306	1.5%	Waste
Total		**19,924**		

Figure 14.4 shows the GHG emissions for the proposed development per life-cycle stage based on the output from the OneClick LCA 3D Designer tool and the TII Carbon Tool combined.

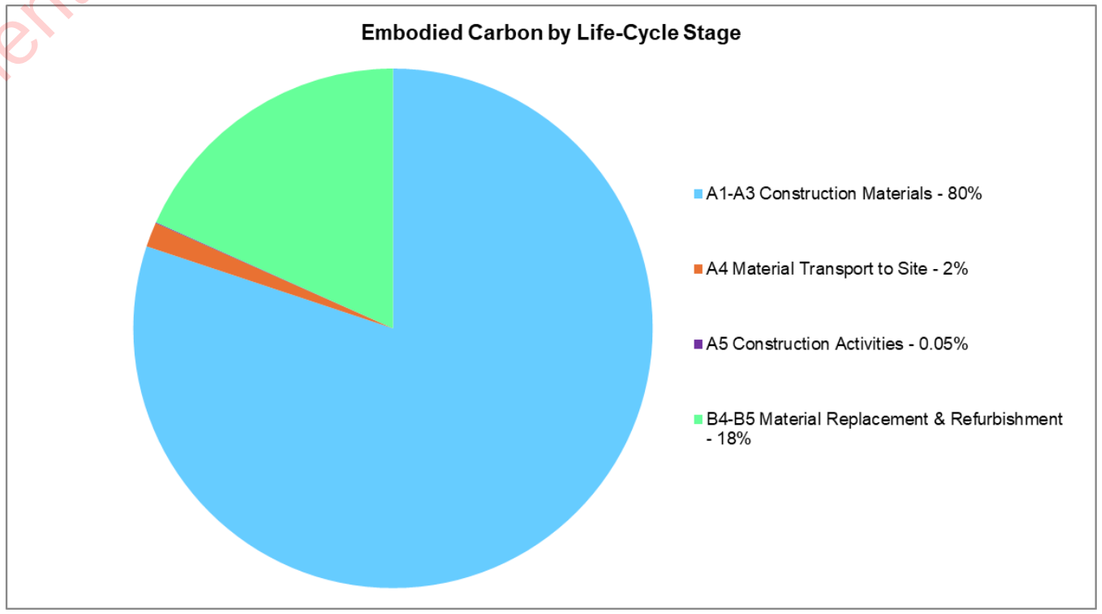


Figure 14.4 Embodied Carbon by Life-Cycle Stage

The total predicted GHG emissions (as shown in Table 14.7) can be averaged over the full lifespan of the proposed development to give the predicted annual emissions to allow for direct comparison with national annual emissions and targets.

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In Table 14.8, GHG emissions have been compared against the carbon budget for the industry, transport, and waste sectors in 2030 (Government of Ireland, 2024), against Ireland's total GHG emissions in 2024, and against Ireland's EU 2030 target of a 42% reduction in non-ETS sector emissions based on 2005 levels (27.7 Mt CO_2e) (set out in Regulation EU 2018/842).

The estimated total GHG emissions, when annualised over the 60-year proposed development lifespan, are equivalent to 0.0006% of Ireland's total GHG emissions in 2024 and 0.001% of Ireland's non-ETS 2030 emissions target. The estimated GHG emissions associated with transport-related activities are 0.0001% of the 2030 Transport budget, construction waste GHG emissions are 0.001% of the Waste budget, industry-related activities are 0.01% of the 2030 Industry budget.

Table 14.8 Estimated GHG Emissions Relative to Sectoral Budgets and GHG Baseline

Target/Sectoral Budget (tCO_2e)		Annualised Development GHG Emissions		% of Relevant Target/Budget
Ireland's 2024 Total GHG Emissions (existing baseline)	57,640,000	332	Total GHG Emissions	0.0006%
Non-ETS 2030 Target	27,722,000	332	Total GHG Emissions	0.001%
2030 Sectoral Budget (Industry Sector)	4,000,000	322	Total Industry Emissions	0.01%
2030 Sectoral Budget (Transport Sector)	6,000,000	5	Total Transport Emissions	0.0001%
2030 Sectoral Budget (Waste Sector)	1,000,000	5	Total Waste Emissions	0.001%

14.7.1.2 Operational Phase

14.7.1.2.1 Operational Energy Usage

The proposed development has been designed to reduce the impact to climate where possible. Several measures have been incorporated into the design to ensure the operational phase emissions are minimised. The primary elements with respect to reducing climate impacts and optimising energy usage are summarised in Section 14.8.1 and are based on information provided in the Climate Action and Energy Statement prepared in relation to the proposed development.

14.7.1.2.2 Operational Traffic Emissions

There is the potential for increased traffic volumes to impact climate during the operational phase. To provide for a worst-case assessment and to assess potential cumulative impacts, the traffic data has included specific cumulative developments within the area (see Transportation Assessment prepared by MHL for further details).

The predicted concentrations of CO_2e for the future years of 2027 and 2042 are detailed in Table 14.9. These are significantly less than Ireland's national 2027 and 2030 targets set out under EU legislation (targets beyond 2030 are not available) and the 2030 sectoral emissions ceilings. It is predicted that in 2027 the proposed development will increase CO_2 emissions by 90 tonnes CO_2e. This equates to 0.00002% of the 2027 national emission ceiling or 0.0001% of the 2030 Transport sector emissions ceiling (see Table 14.9). Similarly low increases in CO_2 emissions are predicted to occur in 2042 with emissions increasing by 51 tonnes CO_2e. This equates to 0.0002% of the 2030 national emission ceiling or 0.0001% of the 2030 Transport sector emissions ceiling (Table 14.9).

In addition, bicycle parking and electric vehicle parking and charging infrastructure will be provided as part of the parking requirements at the proposed development which will promote the use of more sustainable methods of transport.

Table 14.9 Traffic Emissions GHG Impact Assessment

Year	Scenario	CO_2e (tonnes/annum)
2027	Do Nothing	2,564
	Do Something	2,653
2042	Do Nothing	1,604
	Do Something	1,655
Increment Change in 2027		90
National Emission Ceiling 2027 (Tonnes) Note 1		**37,869,352**
Impact in 2027 (as % of national emissions ceiling)		0.0002%
Transport Sector 2030 Emission Ceiling		**6,000,000**
Impact in 2027 (as % of transport sector emissions ceiling)		0.001%
Increment Change in 2042		51
National Emission Ceiling 2030 (Tonnes) Note 1		**27,722,000**
Impact in 2042 (as % of national emissions ceiling)		0.0002%
Impact in 2042 (as % of transport sector emissions ceiling)		0.001%

Note 1 Target under Commission Implementing Decision (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period from 2021 to 2030 pursuant to Regulation (EU) 2018/842 of the European Parliament and of the Council.

14.7.1.3 GHGA Significance of Effects

The TII guidance states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 14.8 has been considered when determining the significance of the proposed development's GHG emissions. According to the TII significance criteria described in Section 14.3.2.3 and Table 14.4, the significance of the GHG emissions during the construction and operational phase is minor adverse. The proposed development aligns with the following GHG significance criteria as per Table 14.4:

- The project's GHG impacts are mitigated through 'good practice' measures.
- The project has complied with existing and emerging policy requirements; and
- Fully in line to achieve Ireland's trajectory towards net zero.

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase, which is ***direct, long-term, negative*** and ***slight***, which is overall ***not significant***.

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14.7.2 Climate Change Risk Assessment

14.7.2.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 14.3.3 and Section 14.7.2.2, which states that there are no residual medium or high-risk vulnerabilities to climate change hazards. Therefore, a detailed CCRA is not required (TII, 2022a). However, consideration has been given to the proposed development's vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 14.8:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow; and
- Major Storm Damage including wind damage.

14.7.2.2 Operational Phase

The sensitivity and exposure of the development to various climate hazards must first be determined to then determine the vulnerability of the proposed development to climate change. Flooding (coastal, pluvial, fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides and fog have been considered as climate hazards in the context of the proposed development.

The sensitivity of the proposed development to the climate hazards is assessed irrespective of the project location. Table 14.10 details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per Table 14.5. The results of the vulnerability assessment are detailed in Table 14.10.

Table 14.10 Climate Change Vulnerability Assessment

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	1 (Low)	2 (Medium)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The sensitivity and exposure of the area was determined with reference to a number of online tools and with input from the various discipline specialists on the project team. It was concluded that the proposed development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections. All vulnerabilities are classified as low.

14.7.2.2.1 Flooding

A Flood Risk Assessment (FRA) was undertaken by OSL Butler Consulting Engineers and is submitted separately as part of this planning application. This document was reviewed to inform the climate change vulnerability assessment and assess the potential for flooding at the proposed development site.

The proposed development is located in Flood Zone C, which indicates flooding is not a risk for the site. An additional 20% rainfall depth is included in the modelling and design of the proposed sites' surface water drainage systems to allow for future climate change effects on rainfall volume. This additional 20% aligns with the medium RCP4.5 scenario; allowing an additional 30% would align with the high end RCP8.5 scenario. However, the risk remains "low" as the drainage design is considered sufficient to account for future climate change. There is no risk of flooding affecting the site area from tidal or fluvial sources. Incorporation of good building practice in design and construction of ground floor level and associated drainage systems, and by maintenance and management of the property will further reduce any residual flood risk.

Additionally, sustainable drainage systems (SuDS) have been incorporated into the proposed development as per the requirements of the *Cork City Development Plan 2022-2028*.

It can be concluded that overall, the proposed development has low vulnerability to flood risk.

14.7.2.2.2 Extreme Wind, Fog, Lightning & Hail

In relation to extreme winds, the building shall be designed to the appropriate standards to account for the relevant wind loadings events for RCP4.5 and RCP8.5. If required as part of the building design, lightning protection shall be provided for. Hail and fog are not predicted to significantly affect the building due to its design.

It can be concluded that overall, the proposed development has low vulnerability to extreme wind, fog, lightning and hail.

14.7.2.2.3 Wildfires

In relation to wildfires, the *Think Hazard!* tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR, 2025), indicates that the wildfire hazard is classified as medium for the Cork area. This means that there is between a 10% to 50% chance of experiencing weather that could support a hazardous wildfire that may poses some risk to life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions. These include increases in temperature and prolonged dry periods. However, due to the project location in a built-up, sub-urban area the risk of wildfire is significantly lessened, and it can be concluded that the proposed development is of low vulnerability to wildfires.

14.7.2.2.4 Landslides

The Geological Society of Ireland (GSI) landslide susceptibility mapping database (GSI, 2025) was reviewed to inform the risk from landslides at the proposed development. There have not been any historical landslide events in the vicinity of the proposed development, and the area is of low susceptibility to future landslides. Therefore, the vulnerability of the proposed development to landslides is classed as low.

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14.7.2.2.5 Extreme Temperatures (Heat & Cold) & Drought

Extreme temperatures, both extreme heat and extreme cold, have the potential to impact the building materials and some related infrastructure and potentially landscape planting. However, the building materials selected at the detailed design and will be done with consideration of the likely future temperature ranges Ireland will experience under RCP4.5 and RCP8.5 up to 2100. Therefore, extreme temperatures are not considered a significant risk.

Throughout detailed design phase, the architects will be using guidance documents to inform with design detail decisions including the EU Commission *Technical Guidance on Adapting Buildings to Climate Change* (European Commission (2021a), LETI emergency design guide (LETI, 2020), and the latest available IPCC report. In addition, should updated EuroCodes be published prior to completion of detailed design, which will include consideration for climate impacts, these design standards will be considered.

14.7.2.2.6 Summary

Overall, the proposed development has at most low vulnerabilities to the identified climate hazards. Therefore, no detailed risk assessment is required.

14.7.2.3 CCRA Significance of Effects

With design mitigation in place, there are no significant risks to the proposed development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the proposed development as a result of climate change are ***direct, long-term, negative*** and ***imperceptible***, which is overall ***not significant*** in EIA terms.

14.7.3 Cumulative Effects

With respect to the requirement for a cumulative assessment the ISEF (ISEF, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that "*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative*".

The traffic data used for the operational phase assessment included cumulative traffic from existing and permitted developments in the surrounding area. Therefore, this impact assessment is cumulative.

As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

14.7.4 Summary

The following table summarises the identified likely significant effects on climate due to the proposed development before mitigation measures are applied.

Table 14.11 Summary of Likely Significant Effects in the absence of mitigation

Likely Significant Effect in accordance with EPA Terminology	Quality	Significance	Extent	Probability	Duration	Type
GHG emissions from construction materials & activities and operational energy usage	Negative	Significant (moderate adverse as per Table 14.4)	National	Likely	Long-term	Direct
Climate change and related vulnerability of the proposed development	Negative	Not significant - slight	Local	Likely	Long-term	Direct

14.8 Mitigation Measures

14.8.1 Incorporated Design Mitigation

A number of measures have been incorporated into the design of the development to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (Section 14.7.2.2).

In relation to operational energy usage information from the Climate Action and Energy Statement prepared for the proposed development has been used to inform this assessment. The proposed development will be Nearly Zero Energy Building (NZEB) compliant in line with the Technical Guidance Part L (2022) of the Building Regulations requirements for the residential elements and Technical Guidance Part L (2022), Buildings other than Dwellings for the creche. As per the Climate Action and Energy Statement he following key elements will be included in the design parameters.

Maximise the passive elements of the design by:

- Specifying building fabric insulation u-values better than the Part L 2022 Regulations.
- Targeting the air permeability to be ≤ 3m3/m2/hr @ 50Pa
- Using the DEAP Software to optimise the façade using differing glazing u-values, light transmittance and solar gain ('g' values).
- Ensuring particular detailing of linear thermal bridging.

Maximising the active elements of the design by:

- Specifying lighting designs that deliver > 90 lumen/ circuit watt
- Specifying lighting systems with occupancy and daylight controls in Landlord areas.
- Specifying high efficiency Heating systems
- Minimise the specific fan power where applicable

The proposed development will incorporate renewable technologies to improve on the RER of 20% specified in the NZEB requirements. Renewable energy options include solar PV panels, ground source heat pumps, air source heat pumps and exhaust air heat pumps.

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Additionally, the Climate Action Energy Statement has considered the following in relation to reduce, where possible, the embodied carbon impact of the proposed development:

- Reduce the weight of equipment.
- Specify products that can be demounted and reused.
- Specify products with long lifespans.
- Mitigate refrigerant impact through low refrigerant Global Warming Potential (GWP) and leakage rates.
- Plant should be easily accessible for inspection, maintenance and replacement.
- Design with adaptation in mind.
- Less is more, design out MEP.
- Source local materials where possible.
- Source materials with an Environmental Product Declaration (EPD) where possible

These identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals of the Climate Action Plan.

14.8.2 Construction Phase Mitigation

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. The following measures to reduce the embodied carbon of the construction works are:

- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.
- Material choices and quantities will be reviewed during detailed design, to identify and implement any lower embodied carbon options, where feasible. For example a 30% minimum clinker replacement in cement may be utilised in line with the requirements for public bodies.

In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

Throughout detailed design and construction phase, guidance documents to inform with design detail decisions shall be reviewed e.g. the EU Commission *Technical Guidance on Adapting Buildings to Climate Change* (European Commission (2021a), LETI emergency design guide (LETI, 2020), and the latest IPCC report.

14.8.3 Operational Phase Mitigation

The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. These measures are outlined in Section 14.8.1 above as incorporated design mitigation. No further operational phase mitigation is proposed.

14.9 Residual Impact Assessment

The impact to climate as a result of a proposed development must be assessed as a whole for all phases. The proposed development will result in some impacts to climate through the release of GHGs. TII reference the ISEF guidance which states that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*". The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible. As per the assessment criteria in Table 14.4 the residual impact of the proposed development in relation to GHG emissions is considered minor adverse, this equates to a ***direct, long-term, negative*** and ***slight***, impact which is overall ***not significant*** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered ***direct, long-term, negative*** and ***imperceptible***, which is overall ***not significant*** in EIA terms.

14.9.1 Summary of Post-mitigation Effects

The following table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 14.12 Summary of Effects Post Mitigation

Likely Significant Effect in accordance with EPA Terminology	Quality	Significance	Extent	Probability	Duration	Type
GHG emissions from construction materials & activities and operational energy usage	Negative	Slight (minor adverse as per Table 14.4)	National	Likely	Long-term	Direct
Climate change and related vulnerability of the proposed development	Negative	Not significant - slight	Local	Likely	Long-term	Direct

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14.9.2 Cumulative Residual Effects

With respect to the requirement for a cumulative assessment the ISEF (ISEF, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that "*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative*".

The traffic data used for the operational phase assessment included cumulative traffic from existing and permitted developments in the surrounding area. Therefore, this impact assessment is cumulative.

As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

14.10 Risk of Major Accidents or Disasters

As detailed in Section 14.7.2.2, climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. However, the potential for flooding on site has been reviewed and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. All climate change related risks were categorised as 'low' as per Section 14.7.2.2.

14.11 Worst Case Scenario

Conservative assumptions have been used as part of this assessment. As a result, Section 14.7 details the worst-case impact for the proposed development.

14.12 Interactions

Climate has the potential to interact with a number of other environmental attributes.

14.12.1 Land, Soils, Geology and Hydrology

The impact of flood risk has been assessed, and the surface water drainage network will be designed to cater for increased rainfall in future years as a result of climate change. The effect of the interactions between climate and land, soils, geology and hydrology are *direct, short-term, negative* and *imperceptible* during the construction phase and *direct, long-term, negative* and *imperceptible* during the operational phase, which is overall *not significant* in EIA terms.

14.12.2 Air Quality

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.

14.12.3 Traffic and Transportation

During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site will result in emissions of CO_2, a greenhouse gas. The effects of the proposed development on climate are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the effects of the interactions between traffic and climate are considered to be *direct, short-term, negative* and *not significant* during the construction phase and *direct, long-term, negative* and *not significan*t during the operational phase, which is overall *not significant* in EIA terms.

14.12.4 Waste

Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. The effect of the interactions between waste and climate are considered to be *direct, short-term, negative* and *not significant* during the construction phase and *direct, long-term, negative* and *not significan*t during the operational phase, which is overall *not significant* in EIA terms.

14.13 Monitoring

Monitoring and reporting of the embodied carbon in the construction phase will be conducted. The aim of monitoring will be to seek further ways to minimise climate impacts. Monitoring will include contractual obligations, in line with the most recent Climate Action Plan and sectoral targets, for the successful tenderer to ensure that the proposed development stays in line with updated aims. Commitments to monitor GHG emissions during the construction phase will also be secured through the final Construction Environmental Management Plan (CEMP). Monitoring will include embodied carbon of construction materials, water usage, power and fuel usage, and waste generation (including reuse and recycling rates). Where monitoring shows that the proposed development is not meeting its targets, further mitigation will be put in place.

Monitoring should also include reviewing potential for extreme weather events which may cause damage during construction. Contractors' Environmental Management System (EMS) will include measures to address risks during such events i.e. flooding.

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14.14 Summary of Mitigation and Monitoring

The following table summarises the Construction Phase mitigation and monitoring measures.

Table 14.13 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Proposed Mitigation	Proposed Monitoring
Impact of proposed development greenhouse gas emissions on climate.	Construction Phase: • Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled. • Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. • Ensure all plant and machinery are well maintained and inspected regularly. • Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. • Sourcing materials locally where possible to reduce transport related CO_2 emissions. • Target embodied carbon rates for detailed design (LETI, 2020).	Monitoring and reporting of embodied carbon of construction materials, water usage, power and fuel usage, and waste generation (including reuse and recycling rates).
Vulnerability of proposed development to future climate change.	• Contractor will be required to mitigate against the effects of extreme rainfall/flooding, extreme winds/ storms, temperature extremes, fog, lightning and hail through site risk assessments and method statements. • All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures.	Monitoring to include reviewing potential for extreme weather events which may cause damage during construction. Contractors' Environmental Management System (EMS) will include measures to address risks during such events i.e. flooding.

The following table summarises the Operational Phase mitigation and monitoring measures.

Table 14.14 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Proposed Mitigation	Proposed Monitoring
Impact of proposed development greenhouse gas emissions on climate.	Incorporated design mitigation relating to operational energy usage. See Section 14.8.1 for further details.	No monitoring proposed.
Vulnerability of proposed development to future climate change.	Incorporated design mitigation regarding drainage design, landscaping requirements, building design. See Section 14.7.2.2 for further details.	No monitoring proposed.

14.15 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to climate. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter, the overall predicted effect of the proposed development is not significant in relation to GHG emissions and climate change risk.

14.16 References and Sources

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CHAPTER FIFTEEN

CULTURAL HERITAGE - ARCHAEOLOGY & BUILT HERITAGE

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CHAPTER 15 | Cultural Heritage - Archaeology & Built Heritage

15.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on the Cultural Heritage environment.

The phrase '*Cultural Heritage*' is a generic term covering a multitude of cultural, archaeological, and architectural sites and monuments in the landscape. For this report, Cultural Heritage is divided into three sub-groups, namely Archaeology, Cultural Heritage, and Architecture.

For the purposes of this report, the terms *'registered' archaeological monuments* and *'registered' architectural structures* refer to sites formally recorded within recognised statutory or non-statutory inventories and registers. These include the Record of Monuments and Places (RMP), the Sites and Monuments Record (SMR), the National Inventory of Architectural Heritage (NIAH), and Protected Structures (PS) identified in the Record of Protected Structures (RPS) contained within the Cork City Development Plan.

Archaeological Heritage

Archaeological heritage refers to the material remains of past human societies and the artefacts associated with them. According to the *Valletta Treaty* (European Convention on the Protection of the Archaeological Heritage, 1992), archaeological heritage comprises:

"*All remains and objects and any other traces of humankind from past times... including structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or under water*."

There are no known registered archaeological monuments on the proposed development site. Within the broader 1 km study area, sixteen registered archaeological sites have been identified. The closest of these is an enclosure (CO086-134), located approximately 100m to the south of the proposed development site (see Fig. 15.1). These registered sites provide evidence of human activity and occupation in the surrounding landscape dating back to the Bronze Age, indicating the archaeological potential of the proposed development site.

Cultural Heritage

Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions, and values. Environmental Protection Agency (EPA) Guidelines (2003), define cultural heritage as including archaeological heritage, architecture, history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers), and place names. The more recent EPA Guidelines (2022) includes archaeology, architectural heritage and folklore and history under the broad category of cultural heritage.

For the purposes of this assessment, cultural heritage refers to the history of the Bishopstown area, as well as placenames, land use, history and the broader cultural landscape of the proposed development site and its environs.

There are no upstanding cultural heritage features on the proposed development site, however, there is a flour mill and mill pond depicted on the site on the Ordnance Survey (OS) 6 inch map of 1841-42.

Architectural Heritage

Architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites, which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

There are no registered architectural structures within the proposed development site. The nearest PS is a church (PS745), which is also a registered archaeological monument (CO074-055002) located in Ballinaspig More, approximately 880m to the northwest.

This chapter should be read in conjunction with the Archaeological Testing Report (Purcell, 2025) provided in **Appendix 15.3; Volume 3**.

15.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Musetta O'Leary of Lane Purcell Archaeology. Musetta holds an MA in Archaeology from University College Cork. Musetta has carried out the Cultural Heritage Section of many diverse EIAR/EIS projects; residential, road construction, industrial, energy delivery, sporting, and quarrying. Musetta has presented expert witness evidence at An Coimisiún Pleanála Oral Hearings and has been involved in the preparation of EIAR's for the following projects:

- LRD Castletreasure, Douglas (2023)
- IDL Midleton Expansion Masterplan (2023)
- Dripsey Quarry, Tullig More (2021)

15.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 'Project Description' of this EIAR. To summarise, the proposed development consists of a Large-Scale Residential Development (LRD) which consists of the construction of 246 no. residential units, a creche and all associated site development works at Ardarostig (Townland), Bishopstown, Cork.

Aspects Relevant to this Assessment

There are no registered archaeological monuments or architectural structures on the proposed development site. A walkover survey conducted on the 21st of March 2025 confirmed significant ground disturbance resulting from tree clearance and root activity. Following consultation with Ger Dowling, Archaeologist & Geophysical Surveyor, it was concluded that these site conditions rendered geophysical survey unfeasible.

Licensed archaeological testing was carried out on the 16th and 17th of July 2025. This investigation identified one small, isolated pit of unknown origin but revealed no finds or features of definite archaeological significance.

Much of Ireland's archaeological heritage survives as subsurface remains, often undetectable at ground level. Although testing did not uncover any significant archaeology, the absence of evidence does not preclude the presence of archaeological material. Given that the proposed development will require extensive topsoil stripping, ground reduction, and excavation, there remains a potential risk to previously unrecorded subsurface remains. Accordingly, any large-scale ground disturbance carries the inherent possibility of impacting unidentified archaeological sites.

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15.4 Methodology

The methodology used to complete this chapter comprised the following;

- A review of the relevant Legislation and Guidelines;
- A desktop assessment of the proposed development site and Study Area. This chapter includes cartographic depictions that highlight key features and characteristics of the proposed development site while additional cartographic representations of the development site and Study Area are given in **Appendix 15.1; Volume 3**;
- A walkover survey of the proposed development site on the 21st of March 2025. The results of this survey are given in Section 15.6.5. Photographs of the walkover are provided in **Appendix 15.2; Volume 3;**
- Archaeological testing. Following consultation with the City Archaeologist, archaeological testing was carried out in July 2025 (Purcell, 2025). A summary of the results of testing is given in Section 15.6.6 while the full report is provided in **Appendix 15.3; Volume 3;**
- An evaluation of the potential significant effects of the proposed development on the archaeological, architectural, and cultural heritage - in Section 15.8. Impacts are assessed in accordance with Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Proposed mitigation measures to be undertaken to prevent or reduce any potential impacts on the archaeological, architectural, and cultural heritage environment - Section 15.9, while Residual Impacts are provided in Section 15.10;

15.4.1 Relevant Legislation & Guidance

In Ireland, the primary means of protecting Cultural Heritage are the National Monument (Amendments) Acts 1930 to 2014, The Heritage Act 1995, the relevant provisions of the National Cultural Institutions Act 1997, The Architectural Heritage (National Inventory) and Historic Monument (Misc. Provisions) Act 1999 and the Local Government (Planning and Development) Act 2000. The government's policies for both the archaeological and architectural heritage are relayed in a series of specific published guidelines.

A new Heritage Bill, sponsored by the Minister for Housing, Local Government and Heritage was enacted by both Seanad Éireann and Dáil Éireann on October 13th, 2023. The Act encompasses laws and provisions aimed at preserving, protecting, and managing sites of historical, cultural, and archaeological significance. **The Historical and Archaeological Heritage and Miscellaneous Provisions Act 2023** will replace the National Monuments Acts 1930 to 2014 and other related legislation with provision for the protection of heritage. It will introduce new measures to protect archaeological structures and sites including; the establishment of a single Register of Monuments, a statutory reporting scheme for newly discovered monuments and provisions to prevent the illicit import and possession of stolen cultural property. The Act is all encompassing covering licensing, a reporting system, and a single Register of Monuments and will strengthen the protection of archaeological and built heritage. In the meantime, the existing legislation will remain in place while the new act is implemented through a series of commencements over the coming years.

This chapter is prepared having regard to the following guidelines:

- *Guidelines on the information to be contained in Environmental Impact Assessment Reports*, 2022 (Environmental Protection Agency);
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements,* 2003 (Environmental Protection Agency);
- *Framework & Principles for the Protection of the Archaeological Heritage,* 1999 (Department of Arts, Heritage, Gaeltacht & the Islands).
- *Policy & Guidelines on Archaeological Excavation,* 1999 (Department of Arts, Heritage, Gaeltacht & the Islands).
- *Architectural Heritage Protection, Guidelines for Planning Authorities*, 2004 (Department of the Environment, Heritage, and Local Government).

Cork City Development Plan 2022-2028 (CCDP) - Local Policies with regards to Heritage

The CCDP includes a range of objectives aimed at safeguarding and enhancing Cork City's archaeological, architectural and cultural heritage. These policies seek to ensure that development respects the historical significance of its setting and protects heritage assets in line with national policy. While there are no recorded archaeological monuments, protected structures, or NIAH-listed buildings within the proposed development site, the following citywide objectives remain relevant:

- Objective 8.2 - Protection of the Archaeological Resource

  Cork City Council will protect and enhance the archaeological value of the site (and their settings) listed in the RMP and the Historic Environment Viewer.

  Cork City Council will ensure that development proposals will protect and preserve archaeological sites discovered since the publication of the RMP.

  To ensure the preservation of archaeological remains in-situ, in accordance with national policy (and in the interest of sustainability), impacts on the buried archaeological environment should be avoided where possible.
- Objective 8.3 - The Value of Archaeological Knowledge

  To require that all appropriate archaeological excavation should be undertaken to the highest possible standards and the information made publicly available. The acquisition and dissemination of knowledge is a core principle for the protection of the archaeological heritage of the city. Cork City Council will endeavour to ensure public dissemination through publications and public lectures.
- Objective 8.9 - Preservation of Archaeology within Open Space in Developments

  In development proposals where archaeology is to be retained in-situ the archaeological remains will be protected, safeguarded and, where suitable, be interpreted in an accessible manner. Where the archaeology being preserved is located in open space, then this will be in addition to the overall open space provisions.

15.4.2 Desktop Study

The desktop study aims to provide a thorough understanding of the archaeological, architectural, and cultural heritage environment of the proposed development site and Study Area by utilising the following sources;

Record of Monuments and Places (RMP)

This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It is a statutory register of all monuments and places believed to be of archaeological importance in the Republic of Ireland. The record is compiled on a county basis and, in the case of Cork, forms a single inventory covering both Cork City and County. The numbering system consists of two parts: the first part is the county code (CO for Cork) followed by the Ordnance Survey (OS) map number (six inches to the mile scale); the second part is the number of a circle surrounding the site on the RMP map, e.g. (CO086-134)

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refers to circle 134 on OS sheet 086 for County Cork. The area within the circle is referred to as the *Zone of Archaeological Potential (ZAP)* or zone of notification for that site. Its diameter can vary depending on the size and shape of the site, but it averages out at approximately 180m. The RMP for County Cork was published in 1998. All RMP sites within 1km of the proposed development site are listed in **Table 15.1.**

Sites and Monuments Record (SMR) Database of the Archaeological Survey of Ireland (ASI)

The purpose of the ASI is to compile a base-line inventory - the SMR of the known archaeological monuments in the Republic of Ireland. It contains details of all monuments and places or sites known to the ASI which pre-date AD 1700, and a selection of monuments which post-date 1700. The large record archive and databases resulting from the survey are continually updated. Archaeological sites which are added to the database are proposed to be included in the next published edition of the RMP and will then be afforded its protection. This database, complete with maps, is available for consultation via the National monuments Service (NMS) website at www.archaeology.ie. All SMR sites within 1km of the proposed development site are listed in **Table 15.1.**

Archaeological Inventory

The inventories for each county are follow-ons by the ASI to the RMPs. They give a written description of each archaeological site in the county. The archaeological inventory for East and South Cork, Volume 2 (Power, Byrne, Egan, Lane & Sleeman, 1994) was published in 1994 and a follow up volume, Volume 5 (Ronan, Egan & Byrne, 2009), was published in 2009.

Files of National Monuments Service (NMS)

These files were consulted to retrieve information on lists of RMP sites that have been afforded added protection such as;

- National Monuments in ownership or guardianship of the state – none in the Study Area
- National Monuments in ownership or guardianship of the local authority – none in the Study Area
- Monuments subject to Preservation Orders and Temporary Preservation Orders – none in the Study Area
- Monuments listed in the Register of Historic Monuments – none in the Study Area.

Database of Irish Excavation Reports www.excavations.ie

This website provides a database of summary accounts of archaeological excavations and investigations in Ireland undertaken between 1970 and 2025. The database was queried for any investigations undertaken in any of the townlands within proximity of the proposed development site and these are listed in **Table 15.2.**

National Inventory of Architectural Heritage (NIAH)

The NIAH was set up under the Convention for the Protection of the Architectural Heritage of Europe or the Granada Convention of 1985. It was established on a statutory basis under Section 2 of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The work of the NIAH involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in a systematic and consistent manner. It is divided into two parts; The Building Survey and Historic Garden Survey (www.buildingsofireland.ie). The main function of both is to identify and evaluate the State's architectural heritage in a uniform and consistent manner, to aid its protection and conservation. The NIAH carried out a survey of the buildings of County Cork and Cork City between 2006 and 2013. Under Section 53 of the Planning and Development Act 2000, all structures considered of regional, national, or international Importance in the survey are recommended for inclusion in the Record of Protected Structures (RPS) by the Minister for Arts Heritage and the Gaeltacht. If this is not adopted by the local authority, the reasons must be communicated to the Department. The Building and Historic Garden Survey for County Cork is available online. The NIAH for County Cork includes approximately 6,500 items of architectural importance in the County. Structures within a roughly 1km radius of the proposed development site which are detailed in the NIAH are listed in **Table 15.1.**

Aerial Photographs

Several aerial photographs published by the Ordnance Survey of Ireland (OSI) and Google Maps, spanning from 1995 to 2025, were reviewed to identify any previously unrecorded archaeological or cultural heritage features on the proposed development site. The imagery reveals no visible archaeological features on the site itself. The north-south boundary running through the area is clearly identifiable, and there is no sign of the millrace, mill buildings, or mill pond depicted on the 1841-42 OS six-inch map. A 2017 aerial photograph clearly shows the recorded levelled enclosure (CO086-134) in a ploughed field approximately 100 meters south of the proposed development site.

LiDAR

LiDAR (Light Detection and Ranging) is a remote sensing method that captures high-resolution topographic data, providing valuable insights into historical landscapes and their past uses. The available LiDAR data reveals no potential archaeological features on the proposed development site. The north-south boundary running through the site is clearly visible and there is no evidence of the millrace, buildings, or mill pond depicted on the 1841-42 OS six-inch map. Additionally, the LiDAR imagery clearly shows the recorded levelled enclosure (CO086-134) situated to the south, outside the development site.

Cartographic Sources

The proposed development site is located at the southwestern extremity of the OS 6-inch map sheet No. 074 (Cork). The wider Study Area also extends into OS map sheet No. 086 to the south and sheet No. 073 to the west.

Three editions of the OS series were consulted (see **Figs. 15.2–15.4**):

- OS 6-inch first edition (1841–42)
- OS 25-inch second edition (1897–1903)
- OS 6-inch third edition (1950)

Earlier cartographic sources were also reviewed and are reproduced in **Appendix 15.1:**

- Down Survey (1656–1658)
- Grand Jury Map (1811)

15.4.3 Site Surveys/Investigations

Due to ground conditions across the proposed development site, it was determined that a geophysical survey could not be conducted. This was confirmed through consultation with Ger Dowling, Archaeologist & Geophysical Surveyor.

Walkover Survey

The primary purpose of a walkover survey is to assess the physical environment in which the proposed development will take place to identify any potential archaeological sites or Areas of Archaeological Potential (AAP) and any features of cultural heritage interest. The proposed development site was inspected on the 21st of March 2025. The results of the walkover survey are discussed in Section 15.6.5 with plates given in **Appendix 15.2; Volume 3**.

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Archaeological Testing

Archaeological testing of the proposed development site was carried out on the 16th and 17th of July, 2025 to determine the presence, extent and significance of any subsurface archaeological remains on the proposed development site which could inform the site's layout and design (Purcell 2025). The scope of the testing and trench layout were agreed in advance with the City Archaeologist, Ciara Brett. One small pit of unknown date was identified during the archaeological testing. No features or finds of archaeological significance were identified. The full testing report is provided in **Appendix 15.3**.

15.4.4 Consultation

A pre-application consultation was held with the Cork City Council Archaeologist, Ciara Brett, during which archaeological testing was requested. The scale and location of the test trenches were agreed in advance with the City Archaeologist. Upon completion, the results of the testing were communicated to the City Archaeologist.

15.5 Difficulties Encountered

A significant portion of Ireland's archaeological heritage survives as subsurface remains, often hidden from view and long forgotten. Until its clearance in 2024, the entire development site was densely covered with trees and scrub vegetation. A walkover survey conducted on the 21st of March 2025 confirmed extensive ground disturbance resulting from tree clearance, root activity, and recent construction works. Following consultation with Ger Dowling (Archaeologist and Geophysical Surveyor), it was concluded that these site conditions rendered geophysical survey unfeasible.

At the northern end of the proposed development site, the terrain consisted of fill material. Here, ground levels at the location of the former mill buildings and mill pond have been artificially raised by approximately 4m.

15.6 Baseline Environment

15.6.1 Archaeology

There are no registered archaeological monuments on the proposed development site. The closest registered site is a levelled enclosure (CO086-134), 100m to the south. In total, there are seventeen registered archaeological sites and six structures listed as PS or in the NIAH, within 1km of the proposed development site (the Study Area), providing evidence for human settlement and activity dating to the Bronze Age (**Table 15.1; Fig.15.1**).

Table 15.1 Registered archaeological and architectural sites in the Study Area

RMP/SMR PS, NIAH	Site Type	Townland	Distance from development site
CO073-069	Ringfort	Ballinaspig More	720m to the W
CO073-111	Fulacht fia	Ballinaspig more	940m to NW
CO073-112	Fulacht fia	Ballinaspig More	870m to NW
CO073-113	Pit burial	Ballinaspig more	550m to the W
CO073-114	Building	Ballinaspig More	800m to the W
CO073-115	Structure	Ballinaspig more	710m to the W
CO073-117	Excavation miscellaneous	Ballinaspig More	710m to the W
CO074-046	Lime kiln	Ballinaspig Beg	880m to the NW
CO074-047	Ringfort	Ballinaspig More	1.1km to the NE
CO074-055001	Designed landscape feature	Ballinaspig More	915m to the NW
CO074-055002 PS745	Church PS church and crypt	Ballinaspig More	880m to NW
CO074-055003	Country house	Ballinaspig More	880m to NW
CO074-128	Burnt mound	Ballinaspig more	210m to the NW
CO074-129	Fulacht fia	Ballinaspig more	166m to the NE
CO086-058	Country House	Chetwynd	910m to the SE
CO086-002 PS1167 NIAH20908603	Railway bridge Chetwynd Viaduct	Chetwynd, Rochfordstown	1.1km to the S
CO086-134	Enclosure	Ardarostig	100m to the S
PS949	Post box	Ballinaspig More	1km to NE
NIAH 20908604	Bridge	Chetwynd	1km to SE
PS1033; NIAH 20869003	Wilton House	Farrandahadore	1.2km to NE
PS1; NIAH 20869001	Wilton Park House	Ballinaspig More	1.1km to NE

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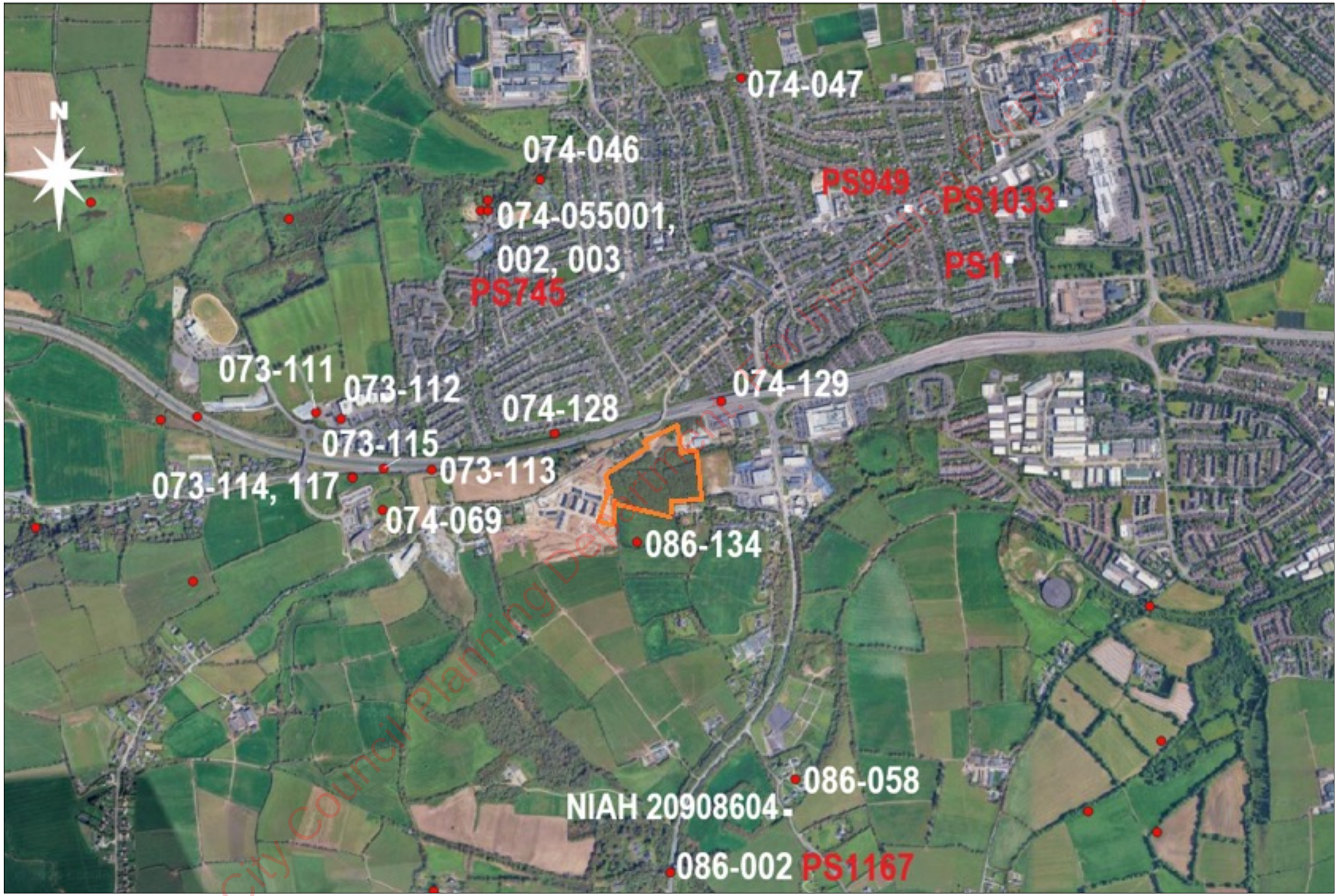


Figure 15.1 Registered archaeological sites (to be prefixed with CO) and registered architectural sites within an approximate 1km Study Area www.archaeology.ie

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The following account of the archaeological and cultural heritage of the Study Area is structured chronologically. The archaeological timescale can be divided into three major periods, each with distinct sub-sections:

- **The prehistoric period:** Mesolithic - (*circa* 8000 to 4000 BC); Neolithic - (*circa* 4000 to 2400 BC); Chalcolithic c. 2450-2200; Bronze Age (*circa* 2200 to 700 BC) – Iron Age (*circa* 700 BC to AD 400).
- **The medieval period:** Early medieval 5th – 12th century; high medieval 12th century – *circa* 1400; late medieval *circa* 1400 – 16th century.
- **Post medieval period:** 17th century onwards

Information on all the recorded archaeological sites in the Study Area is sourced from the ASI database, which derives its data from the Archaeological Inventories of County Cork; Volume 2: East and South Cork (Power *et al.* 1994) and Volume 5 (Ronan *et al.* 2009). Some entries have been updated to reflect more recent research.

Prehistoric Period

The earliest evidence for human colonisation and settlement in Cork dates to around 8000 BC, during the Mesolithic period. The inhabitants of this era were hunter-gatherers who relied entirely on wild resources such as game, edible plants, and shellfish. The transition to a farming lifestyle in the Neolithic period marked a significant shift, as communities began to adopt agriculture, leading to more permanent settlements and a more structured social hierarchy. This period is also noted for the construction of megalithic tombs, reflecting increased social complexity and a growing emphasis on communal practices.

The Chalcolithic, or 'Copper and Stone Age', represents a transitional phase between the Neolithic and the Bronze Age. This era is characterised by the gradual introduction of copper metallurgy, preceding the more widespread use of bronze. It is frequently identified in the archaeological record through the appearance of Beaker Ware, a distinctive pottery style widely adopted during this time.

Within the Study Area, the earliest recorded site is a pit burial (CO073-113) found during archaeological investigations in advance of construction of the N22. The site is located approximately 550m west of the proposed development, in the townland of Ballinaspig More. This burial consisted of a small subcircular pit (0.56m x 0.5m; depth 0.12m) containing a modest quantity of cremated bone and two sherds of Western Neolithic pottery. Radiocarbon dating placed the burial within the Early Neolithic period, between 3960–3700 BC (Ronan *et al.* 2009).

The Irish Bronze Age is defined by the widespread adoption of bronze metallurgy, the emergence of distinctive pottery forms, changing burial traditions, and a growing population. In contrast to the megalithic tombs of the Neolithic, Bronze Age burials were generally simpler, with cremated or inhumed remains placed in stone-lined cists or simple pits, often accompanied by grave goods. Some graves were marked with cairns or earthen barrows, while others were unmarked.

Two fulachta fia (CO073-111 and CO073-112) were identified in Ballinaspig More, approximately 940m and 870m northwest of the development site. Both were discovered during archaeological monitoring in advance of the N22 Ballincollig Bypass and excavated in 2002 (Ronan *et al*. 2009). Fulachtaí fia are commonly interpreted as ancient cooking sites, although they may also have been used for bathing, textile processing, tanning, brewing, fat extraction, or soap making (Ó Drisceoil 1988; Monk 2007; Quinn & Moore 2007).

Typically, fulachtaí fia survive as spreads or mounds of heat-shattered stone surrounding one or more water-filled troughs cut into the ground. The troughs—often lined with timber, wattle, or stone—were located near water sources and used to boil water by immersing fire-heated stones. Experiments show that water could be brought to a boil within twenty minutes, and meat cooked over several hours. Repeated use led to the accumulation of burnt material, forming crescent-shaped mounds.

Excavations at one of the fulachtai fia sites (CO073-112) revealed three phases of activity and two distinct fulachtaí fia. The earliest phase included a sub-oval trough and associated stake-holes. A second trough lay to the northeast, and a third was discovered directly to the south, partially cutting into the second. Radiocarbon dating placed the earliest activity in the Late Neolithic (2800–2500 BC) (Danaher 2004k, 56; see also Ronan *et al*. 2009). The other fulacht fia (CO073-111) site, approximately 70m to the northwest, was dated to the mid-to-late Bronze Age (c. 1500–500 BC), based on radiocarbon evidence (*ibid.*). Although most fulachtaí fia date to the Bronze Age, early examples like the former (CO073-112) highlight their Neolithic origins.

Other nearby Bronze Age sites discovered and excavated in advance of the N22, include another fulacht fia (CO074-129), a burnt mound (CO074-128), and a building (CO073-114), all in Ballinaspig More. The building (CO073-114), 800m to the west of the proposed development site, featured a slot-trench, post-holes, a hearth, and numerous pottery sherds (Ronan *et al*. 2009). To the southwest, a concentration of pits and post-holes (CO073-117) spanning 20 square metres yielded additional Bronze Age pottery and tools *(ibid.*).

Evidence of Iron Age activity in the Study Area was also found in advance of the N22. Approximately 370m northwest of the proposed development site, a circular structure (CO073-115), measuring 7.4m in diameter and defined by an arc of eleven evenly spaced post-holes, was recorded. Charcoal from one post-hole returned a radiocarbon date of 360–280 BC, firmly placing the structure in the Iron Age (Ronan *et al.* 2009).

Early Medieval Period

The Early Christian or early medieval period (5th to the 12th century AD) in Ireland is characterised by the introduction of Christianity from the late 4th century onwards, becoming widely established during the second half of the sixth century. Ringforts (also known by the names rath, lios, cathair or caiseal/cashel) functioned as defended farmsteads and are the most characteristic monument of this period. They are circular or oval in plan defined by an earthen bank with an external ditch or fosse. The sub-surface remains of circular dwelling houses and associated outbuildings are frequently revealed within ringforts during excavation. More occasionally evidence of specialised craft-working is also found during excavation indicating the possibility of higher status sites. The main phase of construction and occupation of these sites dates from the beginning of the 7th century AD to the end of the 9th century AD. Many of these sites appear to have been levelled in modern times by agricultural activity, although archaeological features may remain undisturbed below ground level. There are two ringforts in the Study Area, both of which (CO073-069 and CO073-047) are located in the townland of Ballinaspig More, 720m to the west and 1.1km to the northeast, respectively. The site of one of the ringforts (CO073-069) lies within the grounds of Marymount University Hospital and Hospice. It is described in the ASI as follows; *In pasture, on W side of stream. Roughly circular area (36m N-S; 32m E-W) enclosed by low rise SE->NE, with shallow external fosse; natural sharp fall to stream NE->SE. Fosse truncated by field boundary on N side. Interior saucer-shaped; slopes gently down to E.* The second ringfort (CO073-047), also in Ballinaspig More, is depicted on the OS six-inch map of 1842, as a hachured circular enclosure (diam. c. 35m). There is now no surface trace of the site, apart from a kink in the field boundary to the northeast of Bishopstown Community School gate, which may represent part of the northeastern quadrant of the enclosure (Power *et al.* 1994).

The closest recorded archaeological site to the proposed development is an enclosure (CO086-134), situated approximately 100m to the south. The term *enclosure* is generally applied to sites whose exact function or date cannot be definitively determined. Many such sites are thought to represent ringforts or cashels that fall outside the typical size range for these monument types (i.e. less than 20m or greater than 60m in diameter). In other cases, enclosures may be irregular in form and could date from as early as the Bronze Age to as recently as the 19th or 20th century, when they may have served as animal enclosures or shelters.

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No surface trace of the enclosure is currently visible in the townland of Ardarostig. However, the site is clearly identifiable on LiDAR imagery as a circular feature measuring approximately 60m in diameter, located in the southwestern corner of an agricultural field. A 2017 aerial photograph also captures the outline of the enclosure following ploughing of the field, further confirming its presence (see **Appendix 15.2; Plate 1**).

Post Medieval Period

Approximately 880m northwest of the proposed development site, in the townland of Ballinaspig More, stand the fragmentary remains of Bishopstown House, now situated within a public park. The house and its surrounding demesne were constructed in 1726 by Bishop Peter Browne for the Church of Ireland bishops of Cork. Demolished around 1831, the site is now partly occupied by a modern L-shaped Scout Hall. The only surviving architectural element is a finely crafted limestone shouldered doorcase, rebuilt into a recent structure (McCarthy 1981).

Taylor and Skinner's 1778 map depicts the house with gabled end wings on its front elevation. In 1981, McCarthy recorded a partially intact courtyard to the south, formerly enclosed by farm buildings (as shown on the 1842 OS map). At that time, only the deteriorating southern wall and entrance piers survived, along with some of the original cobbling. The cobbles featured ornate patterns in differently coloured stones, including the date '1726' and the initials 'PB' (McCarthy, ibid.).

At the northwest corner of the courtyard lie the remains of a chapel (CO074-055002; PS745), consecrated in 1730 and labelled as 'Bishop's Chapel (in ruins)' on the 1842 OS map. By 1848, its datestones and memorials had been relocated to St Finbarr's Cathedral. McCarthy (*ibid.*) noted cut limestone chamfered quoins, a west entrance with a later porch, and an east doorway that may once have connected to the mansion via a covered passage. A vault beneath the east gable originally housed the remains of Peter Browne and Isaac Mann; these were moved to the cathedral in 1865. The foundations of the original house were reportedly reused in a farm building along the north side of the courtyard (McCarthy 1981).

Other estate features recorded by McCarthy include a terraced lawn north of the house, known as 'The Bishop's Garden' leading down to the Curraheen River. This river is crossed by two three-arched footbridges; to the east of the bridges lies a low waterfall, while to the northwest of the chapel are ornamental ponds and a 'shell house' (CO074-055001-). The shell house, located atop a landscaped rock outcrop (CO074-05502-) and depicted on the 1842 OS map, is a roofless, crenellated circular tower (H 2.3 m; int. diam. 4.55 m) built as a retreat by Bishop Peter Browne (1710–1735) as part of the Bishopstown demesne (CO074-05503-) (McCarthy 1981).

A limekiln (CO074-046---), situated 170m northeast of the house site, also forms part of the former demesne. Limekilns were common features of the Irish rural landscape from the 18th to 20th centuries, producing lime by burning limestone at temperatures of 900–1000 °C. Lime had numerous uses in farming, as a fertilizer, soil improver, disinfectant wash, mortar component, pest deterrent, and frost protection for stored potatoes. Many such kilns have since been destroyed, become overgrown, or faded from the landscape.

Approximately 1 km southeast of the proposed development lies the Chetwynd Viaduct (CO086-002; PS1167; NIAH 20908603), an impressive local landmark (see Section 15.6.3).

No archaeological investigations have been undertaken on the proposed development site. Those undertaken within the Study Area and greater region are listed and summarised in **Table 15.2** below (www.excavations.ie).

Table 15.2 Archaeological investigations undertaken within the Study Area

Excavation Ref.	Townland/ Location	Details
2001:105	Ballinaspig More	Test-trenching was undertaken in advance of construction of the N22 Ballincollig Bypass. During this process an area of black, charcoal-stained clay, with substantial inclusions of heat-cracked stone fragments, was noted. The surrounding area was stripped of topsoil, hand-cleaned and the extent of the deposit established. The deposit was irregular and separated into distinct parts. Overall maximum dimensions were 10m by 5m with a maximum depth of 0.4m. The irregularity of the deposit would suggest that it has been heavily truncated by ploughing. Excavation revealed that the spreads only survived in natural depressions within the prehistoric ground surface. No pits or associated features were discovered. The excavated deposits were poor in charcoal and no samples suitable for dating purposes were obtained (Murphy, 2001).
2001:107	Ballinaspig more	In the process of test-trenching along the proposed route of the N22 Ballincollig Bypass an area of dark brown sand containing burnt stone was identified. The surrounding area was stripped of topsoil and the full extent of archaeological deposits was established. The principal fulacht deposit measured 8m by 2m and the maximum depth was 0.2m. Underlying the deposit was a subrectangular pit with dimensions of 2.5m by 2m and a maximum depth of 0.4m. The sides of the pit were generally gently sloping, although on the southern side the edge was close to vertical. The base was flat and the fill consisted of fulacht material. It seems probable that this pit would have functioned as a trough during usage of the fulacht. No finds were recovered and no deposits produced samples capable of providing radiocarbon dates (Murphy, 2001).
2010:106	Ardarostig/ Garrangarragh	A second phase of testing was undertaken in Ardarostig/Garranedarragh 1 within the footprint of the N71 Chetwynd viaduct road scheme on 6 September 2010. Ardarostig/ Garranedarragh 1, a wooded area to the west of the existing N71, was unavailable at the time of testing stage (i) undertaken by Sheelagh Conran between March and May 2009 (*Excavations 2009*, No. 11128, 09E0135). The area is densely wooded and overgrown with shrubbery and has non-specific archaeological potential. The Glasheen River bisects the area with Ardarostig townland to the west and Garranedarragh townland to the east. A total of six trenches were excavated within the heavily wooded area to the west of the Glasheen River. All trenches were excavated to subsoil using a 5-tonne tracked excavator fitted with a toothless bucket. No archaeological features or deposits were recorded during the testing. In tandem with the test-trenching, a wade survey, including a metal-detector survey, was carried out along the Glasheen River in the area of the proposed development. The survey did not identify any features or deposits of archaeological significance; however, the dense overgrowth in the survey area impacted greatly on the efficiency of the survey (Coughlan, 2010).

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Excavation Ref.	Townland/ Location	Details
2010:127	Doughcloyne, Garrendarragh, Ardarostig	On 23–30 August 2010 testing was carried out on behalf of Cork City Council in advance of a proposed upgrade to the N25 Cork South Ring Road, specifically between the Sarsfield Road roundabout and the Bandon Road roundabout. None of the test-trenches investigated revealed any material of archaeological significance. The strata from the various box trenches proved relatively consistent and findings indicated the presence of deep to marginal peat formations over glacial outwash. The presence of a potential early Holocene alluvial fanning from the Glasheen River is suggested by the presence of substantial deposits of fine silt/clay in several of the trenches. The tested remains suggests the area was poor marginal bogland from the early Holocene period up until possibly as late as the 18th century, when deep deposits of sterile stony clay were introduced over the bog in an apparent effort to level off and dry out the land to become agriculturally productive. In fact severance, caused by the construction of the existing N25 Cork South Ring Road, led to the area reverting back to marshland (Conran, 2010).
2023:476	Ardarostig	Archaeological monitoring was carried out on the northern portion of this large residential development site. No features or finds of archaeological significance were identified. Further monitoring will be undertaken when the next phase of the development progresses (Purcell, 2023).

15.6.2 Cultural Heritage of the Study Area

The proposed development site is located in the townland of Ardarostig, within the parish of Inishkenny and the barony of Cork. In the mid-17th century, the Down Survey recorded the townland (spelt 'Ardrostig') as part of the Parish of St. Finbarr's in the Barony of Cork (**Appendix 15.1; Fig. 1**). Comparison with modern cartographic sources shows that, while the barony designation has remained unchanged, subsequent boundary revisions have placed Ardarostig within the Parish of Inishkenny. This reflects broader post-medieval and early modern adjustments to parish boundaries, as civil parish divisions evolved independently from earlier ecclesiastical jurisdictions.

On the Down Survey map, the northeastern portion of Ardarostig - where the proposed development is situated, is shown with stippling/hatching to denote unprofitable land, while the remainder is depicted as arable. This distinction provides an insight into historic patterns of land use. The development site lies along Waterfall Road, approximately 5km south of Cork city centre, 2.8 km northeast of Waterfall village, and adjacent to the Bishopstown suburb. It also falls within the expanded Cork City development boundary.

The Grand Jury map (c. 1811) depicts Ardarostig in italic script as a named locality situated south of Bishopstown and north of Rochfordstown, along a minor road linking to Cork City (**Appendix 15.1; Fig. 2**). The surrounding area is illustrated with hachuring, indicating elevated or undulating terrain corresponding to the topographic rise in the northeastern part of the townland. Unlike the Down Survey map, which differentiates profitable from unprofitable land, the Grand Jury map emphasises settlement pattern, road connectivity, and relief and provides further context for understanding the historical landscape in which the proposed development is located.

Townlands and Placenames

In Ireland, the county is the principal administrative unit, with Cork being the largest. The townland is the smallest and most ancient division of land, with over 62,000 recorded across the country. Unique in Western Europe in terms of both scale and continuity, many townland boundaries recorded by the Ordnance Survey in the 19th century reflect much earlier land divisions, sometimes coinciding with archaeological features (O'Connor, 2001). Most townlands predate the Anglo-Norman period, and are frequently referenced in early Irish historical sources to locate events and describe ownership. While they predate both parish and county boundaries, townland names and limits were standardised during the OS mapping programme, during which Irish names were systematically recorded and anglicised—a process that helped preserve much of Ireland's toponymic heritage.

The name *Ardarostig* derives from the Irish *Ard an Róistigh*, meaning 'Roche's Height'. It first appears in 1586 in the Inquisitions of County Cork - legal documents compiled to establish land ownership, inheritance, and taxation. At that time, it was recorded as *Ardirostige*. The modern spelling, *Ardarostig*, appears in the Civil Survey of County Waterford (1654–56) (www.logainm.ie).

Many surrounding townlands preserve their Irish origins;

- Ballinaspig More (*Baile an Easpaig Mór*) – 'The bishop's big settlement'
- Ballinaspig Beg (*Baile an Easpaig Beag*) – 'The bishop's small settlement'
- Ballynora (*Baile an Óraigh*) – 'Honora's town'
- Ballymah (*Baile Mha*) – interpreted as 'Good town'. In 1900, this townland was referred to as *Máighe*, *Mawe*, etc., which derives from *Mac Máigheóc* or *Mac Máigheóg*, meaning 'son of May' - a patronymic surname associated with a branch of the Condon family in East Cork and Waterford (www.logainm.ie).

Two other nearby townlands include:

- Rochfordstown (*Baile an Rosfortaigh*) – meaning 'Rochford's townland', named after the Anglo-Norman Rochford family who settled in Ireland following the 12th-century invasion (www.logainm.ie).
- Chetwynd (*Baile an Ghiolláin*) – the original Irish name Balie on Ghiollain translates as 'Settlement of Ó Giolláin'. *Ó Giolláin* is derived from *Giollán*, a diminutive of *giolla* meaning 'servant' or 'follower'. The surname was later anglicised to *Gillen*, *Gillan*, or *Gillon* (www.logainm.ie).

Demesnes and Historic Estates

The OS map of 1842 depicts the proposed development site in a rural landscape with a number country houses and their demesnes in the vicinity (**Appendix 15.1; Fig.3**). These include Garrane House and Doughcloyne House, c. 630m and 1.3km to the east, respectively (both no longer extant), a second Doughcloyne House 1.5km to the southeast, Wilton House 1.2km to the northeast and Bishopstown House 900m to the northwest. These country houses and demesnes largely date from the 18th and 19th centuries. While demesne landscapes were present in medieval Ireland, those still visible in today's landscape typically originate from the mid-18th century, when Irish landowners adopted the 'natural style' landscape park. A typical demesne consisted of a 'big house' associated outbuildings, landscaped gardens, ornamental features, woodlands, and was often enclosed by high walls or tree belts. According to Aalen, Whelan & Stout (2000, p. 197), demesnes once covered approximately 6% of Ireland's land area, although many have since been significantly reduced in scale.

The closest demesne to the development site is Garrane House, located c. 630m to the east. It is depicted on the 1st Edition OS map as being set within a planted demesne landscape. According to the Landed Estates Database, it was occupied in the early 1850s by Francis Hennis, who leased it from William Howe Hennis; the property was valued at £30. A building remains on the site today (www.landedestates.ie).

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Bishopstown House (RMP CO074-055003), situated c. 900m northwest of the site, preserves fragmentary remains of an early 18th-century episcopal demesne established by Bishop Peter Browne. This former demesne landscape is now part of a public park and is still known locally as The Bishop's Garden, as described above in the Post Medieval Period.

Approximately 1.3km to the east of the proposed development site lies the former Doughcloyne House, originally the residence of the Ronayne family, later transferred by marriage to the Sarsfields. It was occupied by Dr. Sarsfield in the 1770s–1780s, Mr. Haynes in 1814, D. Sarsfield in 1837, and Thomas R. Sarsfield in the early 1850s, who held the property in fee with a recorded value of £43. By 1894, Slater's Directory listed it as the seat of Captain T.R. Sarsfield. The house is no longer extant (www.landedestatesdatabase.ie).

Railway Infrastructure

Two historic railway lines once traversed the study area, both illustrated on the OS 25-inch (1897-1903) (**Appendix 15.1; Fig. 3**). The Macroom Direct Railway (Cork to Macroom) passed approximately 50m north of the proposed development site and now lies beneath the Cork South Ring Road (N40). Opened in 1866 after three years of construction, it initially shared a terminus with the Cork and Bandon Railway before establishing its own at Capwell. It was absorbed into the Great Southern Railway in the 1920s. The line ceased passenger services in 1935 and was fully closed by 1953, after parts were submerged during the creation of a hydroelectric power station in the Lee Valley (Johnson, 2005). Within the study area, the line ran through the townlands of Ardarostig, Ballinaspig More, Garranedarragh, and Doughcloyne.

The second line, the Cork, Bandon, and South Coast Railway, ran from Baltimore to Cork, passing c. 650m to the south/southeast of the development site. The first section, from Cork to Bandon, was constructed in 1845, with the Ballinhassig–Bandon stretch completed in 1849 due to the construction of a tunnel and the Chetwynd Viaduct (CO086-002; PS1167; NIAH 20908603). The line extended to Dunmanway (1866), Skibbereen (1877), and Baltimore (1893). All West Cork lines were closed in 1961 (Johnson, 2005). In this area, the railway passed through the townlands of Garranedarragh, Chetwynd, and Rochfordstown.

Waterfall and Bishopstown

The nearby village of Waterfall (its Irish name is *Tobar an Iarla*, 'well of the earl') lies 2.8km southwest of the proposed site, in the parish of Ballinora. Its name likely reflects a historical connection to local nobility (www.logainm.ie). Waterfall is historically associated with the Cork, Bandon & South Coast Railway. The station opened in June 1851 and operated until March 1961, when it was closed by Córas Iompair Éireann (CIE). It featured up and down platforms, with a single-storey station building, signal cabin, and loading bank on the down side, and a waiting shelter on the up side. Today, only the platform remains (www.eiretrains.com). A sandstone railway bridge (RMP CO084-114) from the 1850s survives as a key feature, and a 1940s cast-iron bilingual signpost ('Tobar an Iarla / Waterfall') marks the village entrance, contributing to its vernacular heritage character. Just northwest of Waterfall, the railway line crossed the N71 via the Chetwynd Viaduct, an imposing mid-19th-century engineering structure that remains extant and is further discussed in Section 15.6.3.

The name Bishopstown (Irish: *Baile an Easpaig*, 'town of the bishop') reflects the area's ecclesiastical heritage, stemming from lands historically held by the Bishops of Cork. These lands likely formed part of the medieval estate of the bishopric of Cork, associated with Gill Abbey and the wider ecclesiastical complex of medieval Cork (Ó Murchadha, 1991). The 1841–42 First Edition OS map depicts Bishopstown as a rural area with dispersed farmsteads, vernacular dwellings, and field systems along historic laneways. Suburban expansion began in the 1950s, driven by housing demand and proximity to University College Cork (UCC), later followed by Cork Institute of Technology and Cork University Hospital. By the late 20th century, Bishopstown had evolved into a significant residential suburb, although elements of its earlier rural landscape survive in field boundaries, historic laneways, and placenames that preserve its ecclesiastical origins.

15.6.3 Architectural Heritage

There are no PSs or structures listed in the NIAH on the proposed development site. The nearest PS is a church (PS745), which is also a Recorded Monument (CO074-055002) located in Ballinaspig More, approximately 880m to the northwest. This site is described in detail in Section 15.6.1 above.

Three additional structures of architectural heritage interest are recorded within the wider Study Area. These include:

- Wilton Park House (PS1; NIAH Reg. No. 20869001)
- A cast-iron post box in Ballinaspig More (PS949)
- Chetwynd Viaduct (PS1167; NIAH Reg. No. 20908603; RMP CO086-002), along with an associated road bridge (NIAH Reg. No. 20908604) in Chetwynd

Wilton House and Wilton Park House

Wilton House (PS1033; NIAH 20869003), situated c. 1.3km to the northeast of the proposed development site in the townland of Farrandahadore More is a substantial former country house located in the modern suburb of Wilton. Constructed c. 1820, it originally comprised a five-bay, two-storey central block over a half-basement, flanked by four-bay two-storey wings. These terminate in two-bay, two-storey, gable-fronted advanced bays, later extended c. 1930 with additional five-bay, double-pile wings. The building is situated within landscaped grounds that retain elements of its original demesne character, particularly to the south. Despite successive extensions, Wilton House retains architectural coherence, with fine stucco detailing to the north elevation that enhances its visual and artistic interest. Like many former country houses, it has had a variety of uses. From the late 19th century, it served as St Joseph's College, a formation house for students of the Society of African Missions (SMA) preparing for missionary work in Africa. Today, it continues to function as a retirement home and mission centre for SMA members. It forms part of a group of related structures that includes a church and associated graveyard.

Located within the former Wilton House demesne is Wilton Park House (PS1; NIAH 20869001), a modest late 19th-century residence constructed by Thomas Jennings c. 1894–95. Situated approximately 1.1km northeast of the proposed development site, in the townland of Ballinaspig More, the house was originally built for Jennings's widowed mother. It later came into the possession of the Society of African Missions (SMA) and, following restoration in 1977, was transferred to the Bishopstown Community Association in 1979. Wilton Park House is considered a fine example of suburban domestic architecture from the period and contributes to the layered architectural character of the Wilton area.

Chetwynd Viaduct

Situated to the south of the Study Area, the s a landmark four-span railway viaduct constructed in 1849 to carry the former Cork to Bandon railway line. It was designed by engineer Charles Nixon and exemplifies mid-19th-century engineering and craftsmanship. The viaduct comprises coursed ashlar limestone piers with corner pilasters and brick piers supporting steel girder trussed round-headed arches. The superstructure features limestone block parapets, coping stones, and a string course. Originally constructed to accommodate a single railway track, the viaduct remained in use until the closure of the West Cork railway line in 1961.

Rising approximately 90 feet above the Cork-Bandon road, with spans of 21 feet each, the structure demonstrates a skilful combination of stone masonry and early steel engineering. It remains a prominent and well-preserved feature in the local landscape and is a key element of the area's transport and industrial heritage (NIAH).

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15.6.4 Cartographic Information

The OS 6-inch map (1841-42) – Figure 15.2

The 1841-42 OS 6-inch map depicts the area of the proposed development site as comprising portions of seven fields of varying sizes, set within a predominantly rural, agricultural landscape. The eastern half of the site is occupied by a substantial flour mill complex, including a mill pond and associated mill races, characteristic of an early 19th-century water-powered industrial installation. The mill building lies north of the mill pond and a number of other nearby roadside structures (outside the proposed development site) likely represent workers' accommodation. Two mill races are depicted extending northwest to the mill pond, passing through the proposed development site from a second millpond and the Glasheen River to the southeast. A road leads to the mill complex from a cross roads to the east while the mill building and pond border a N-S road to their west. This road runs through the centre of the area of the proposed development site and then turns to join the Bandon Road a short distance to the east. There is a small rectangular roadside structure close to the east turning angle of the road at the end of a line of trees just beyond the southern site boundary. Remnants of this structure were identified during the walkover survey (see Section 15.6.5), confirming the survival of elements of the 19th-century landscape.

The western half of the site is depicted as agricultural land, comprising one medium-sized field and portions of three others containing no built features. Beyond the northern boundary of the site, there is a crossroads, with several small nearby structures representing rural dwellings or outbuildings. Outside the southern site boundary there is a cluster of buildings accompanied by a formally planted area, possibly indicative of a strong farmers l estate. Overall, the cartographic evidence reflects a mixed-use rural setting with industrial activity in the 19th century.

On the OS 25-inch map (1902) – Figure 15.3

The OS 25-inch map of 1902 shows the area of the proposed development site as comprising parts of five fields, all in agricultural use, likely for pasture or cultivation. The mill complex appears to have been dismantled, with only a couple of roofless structures remaining. The mill pond and associated races are no longer evident. There is one spring depicted at the northeast angle of the site.

The Macroom Direct Railway line is shown on this map running east–west, approximately 50m north of the proposed development site boundary, reflecting broader infrastructural development in the area by the turn of the century.

OS 6-inch map (1950) – Figure 15.4

By the mid-20th century, the OS 6-inch map of 1950 depicts the area of the proposed development site as comprising portions of four separate field. The flour mill complex is now entirely absent there are remnants of the more southerly millrace. The small rectangular building located just outside the southern boundary of the site remains, though it is shown as roofless.

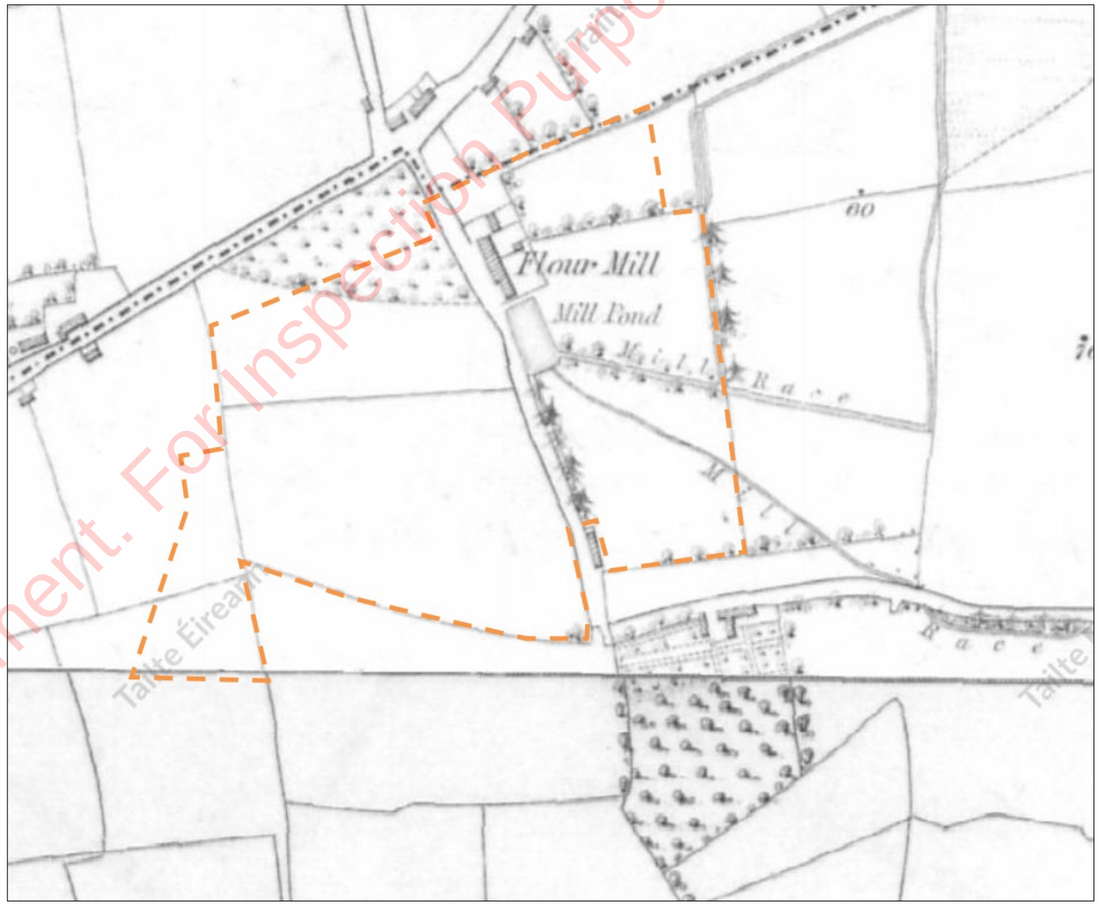


Figure 15.2 Proposed development site outlined on OS six-inch map of 1842 www.archaeology.ie

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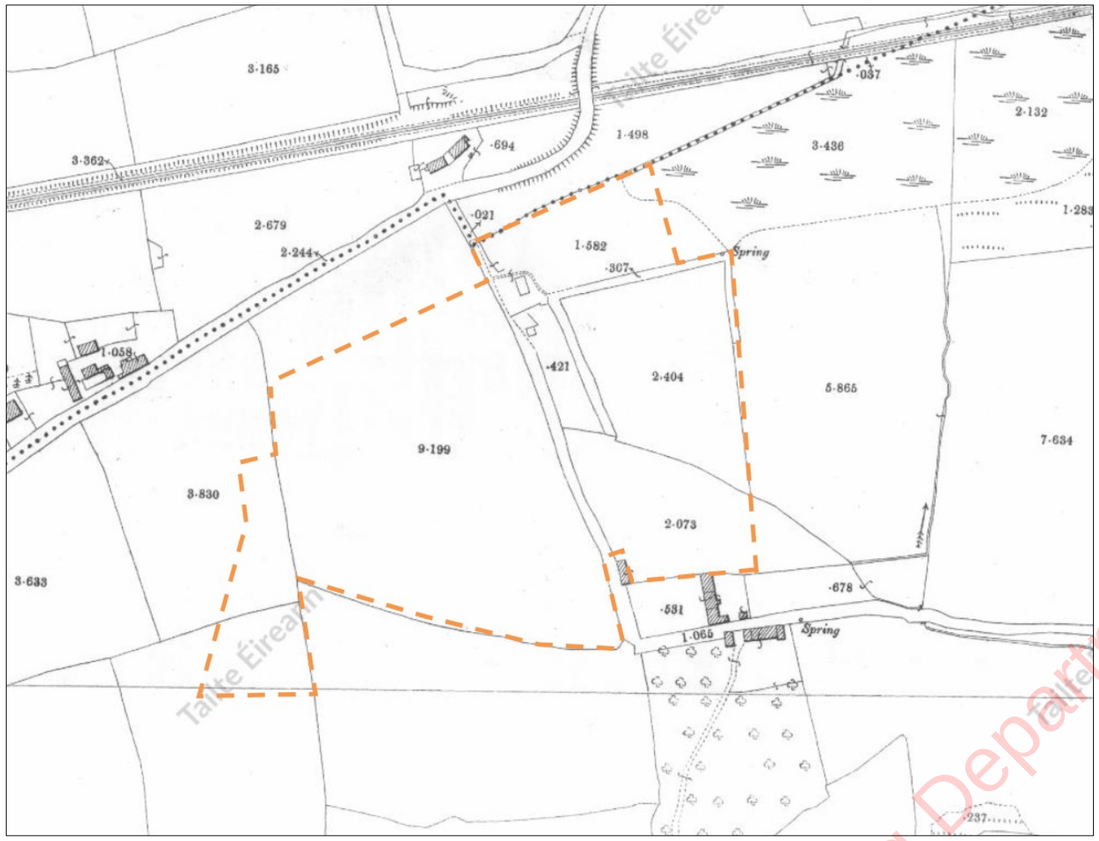


Figure 15.3 Proposed development site outlined on OS 25-inch map 1897-1903 www.archaeology.ie

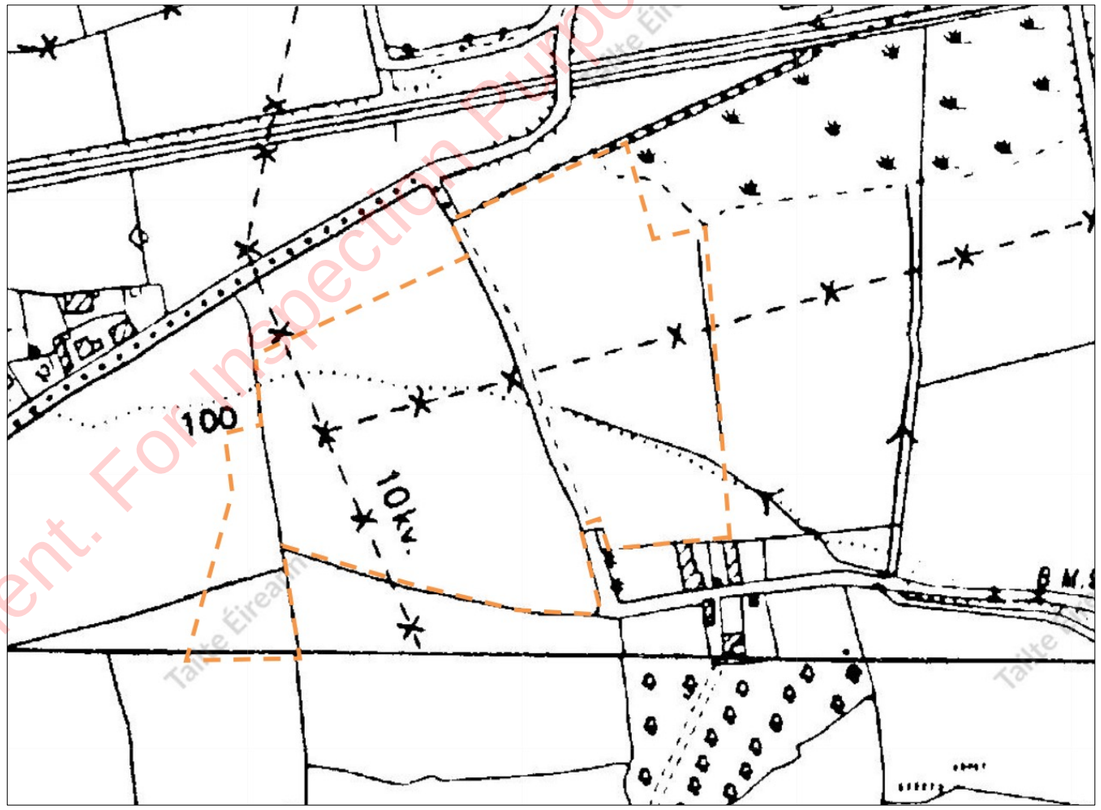


Figure 15.4 Proposed development site outlined on OS six-inch map 1950 www.archaeology.ie

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15.6.5 Walkover Survey

The primary objective of a walkover survey is to assess the physical environment of the proposed development site and to identify any previously unrecorded features of cultural heritage significance. As part of this process, current land use, topography, and environmental conditions are evaluated to provide a comprehensive understanding of the site's character and its potential archaeological or historical interest. The proposed development site was inspected on the 21st of March 2025, under dry weather conditions. The following observations were recorded:

The site is located to the south of the Bandon Road Roundabout on the South Ring Road (N40) and is accessed via the Waterfall Heights residential development on its western side. A small western extension of the proposed development site lies within the footprint of Waterfall Heights. This area is under construction, has been stripped of topsoil and forms part of a permitted development. The main site comprises two large open fields, both of which were densely overgrown with trees and scrub vegetation until cleared in 2024. The site was fully accessible at the time of the survey, and a comprehensive walkover was undertaken. Cleared vegetation had been stockpiled in several locations across the site. At the northern end, the ground level has been artificially raised by approximately 4m. No evidence of the former mill complex or associated features - depicted on the OS 6-inch map of 1842 -was identified in this area.

No features of archaeological or historical significance were observed within the site boundary during the survey. However, immediately outside the southern boundary, near its central section, the remains of a rectangular structure - depicted on the 1842 OS map - were identified. The structure is constructed of random rubble masonry, is roofless, and is heavily overgrown. A photographic record of the observed field conditions is presented in **Appendix 15.2; Volume 3.**

Site Boundaries

- Northwest: Bounded by existing one-off residential properties.
- Northeast: Adjacent to a pedestrian path and commercial premises, including Heiton Steel.
- Southeast: Adjoins a mix of commercial (e.g., Munster Loo Hire) and residential properties, along with areas of rough ground.
- Southwest: Bordered by open farmland.
- West: Adjacent to the Waterfall Heights residential development.

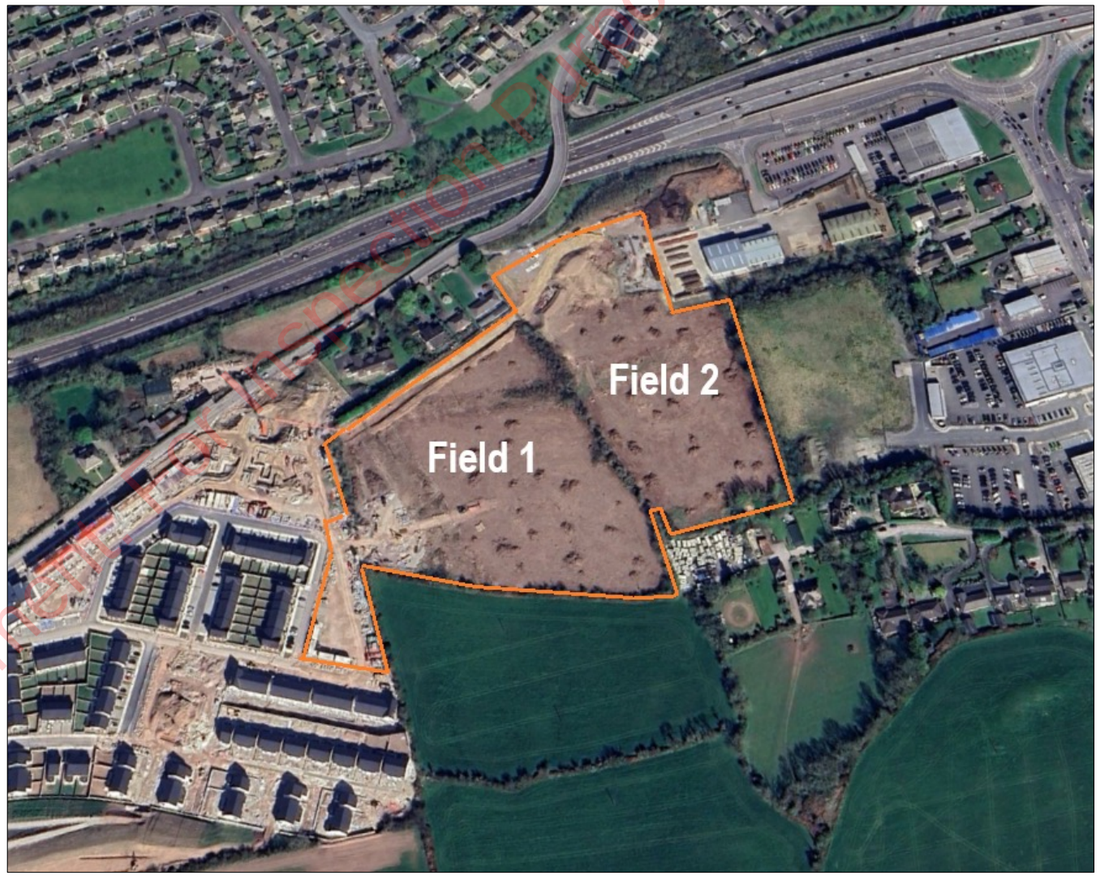


Figure 15.5: Proposed development site on aerial photograph. Source: *Google Earth Pro, imagery date: August 2025, accessed August 2025* **https://earth.google.com/web/**

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15.6.6 Archaeological Testing

A walkover survey conducted on the 21st of March 2025, confirmed significant ground disturbance across the proposed development site, primarily resulting from previous tree clearance, extensive root activity, and recent construction-related works. Following consultation with Ger Dowling, Archaeologist and Geophysical Surveyor, it was concluded that these site conditions rendered a geophysical survey unfeasible. Subsequently, and in consultation with the Cork City Archaeologist, it was agreed that licensed archaeological testing of the site would be undertaken to assess the potential for subsurface archaeological features. The number and location of test trenches were determined in advance and approved by the City Archaeologist.

A total of fifteen test trenches were excavated on 16 and 17 July 2025 under archaeological license (Purcell, 2025). All trenches were mechanically excavated using a grading bucket and measured 2.2 metres in width. The investigation identified a single, small isolated pit of unknown origin but revealed no finds or features of archaeological significance. The full testing report is provided in **Appendix 15.3**.

15.7 The 'Do Nothing' Scenario

In the event that the proposed development does not proceed, the existing landscape will remain in its current form. This would preserve the site's present condition and ensure that any potential, as yet unidentified, archaeological features or deposits beneath the surface would remain undisturbed.

15.8 Potential Significant Effects

15.8.1 Demolition Phase

There are no structures of archaeological, architectural, or cultural heritage significance within the proposed development site. As such, no significant effects on cultural heritage are anticipated during the demolition phase.

15.8.2 Construction Phase

Registered Archaeological Monuments

There are no registered archaeological monuments within the proposed development site. As such, no direct or indirect effects on any registered archaeological sites are anticipated during the construction phase.

Potential for previously unknown archaeological sites or features

Much of Ireland's archaeological heritage exists as subsurface remains, often unrecorded and vulnerable during ground-disturbing activities. The construction phase involves extensive topsoil stripping and ground reduction, which has the potential to directly impact any previously unknown archaeological sites.

The development site has undergone considerable ground disturbance due to extensive root activity and recent tree clearance. Archaeological testing, conducted in July 2025, involved the excavation of 15 test trenches across the site. The investigation identified one small, isolated pit of unknown origin, and no features or finds of archaeological significance were recorded. However, there remains the potential for previously unrecorded remains to survive below ground, there remains a low to moderate potential for the presence of subsurface archaeological features on the site.

Assessment of Impact

Any impact on previously unknown archaeological features would be direct and negative in nature. The significance of such an impact remains uncertain, as it depends on the presence, extent, and character of any unrecorded remains encountered during construction.

Architectural Heritage

There are no PSs, structures listed in the NIAH, or buildings of architectural merit on the proposed development site. As such, no direct or indirect effects on architectural heritage are anticipated during the construction phase.

15.8.3 Operational Phase

The completed development is not expected to generate any impacts on archaeological, architectural, or other cultural heritage resources. Therefore, no significant effects are predicted during the operational phase.

15.8.4 Cumulative Effects

Cumulative effects on cultural heritage have been considered in the context of other existing and proposed developments in the surrounding area (see Chapter 1 for planning context). The proposed development does not intersect with, or directly impact, any known or recorded archaeological sites or structures of architectural heritage significance.

Licensed archaeological monitoring was carried out on the northern half of the adjacent Waterfall Heights residential development in July 2023 (Purcell and O'Leary, 2023). No archaeological features or finds were identified during these works.

While no cultural heritage assets have been recorded on the proposed development site, cumulative ground disturbance resulting from multiple developments in the wider landscape may increase the likelihood of encountering unrecorded subsurface archaeological remains. Should such features be uncovered and subsequently preserved by record, their removal would constitute a permanent loss to the cultural landscape, contributing to a negative cumulative impact.

As no archaeological features were identified during testing, and any potential remains are currently unknown and located below ground, the extent and significance of cumulative effects cannot be fully determined at this stage.

15.8.5 Summary

It is expected that the proposed development will not significantly affect cultural heritage during the demolition, construction, or operational phases. There are no known archaeological monuments, protected structures, or buildings of architectural merit within the site boundary and archaeological testing identified no features of significance, aside from one small, isolated pit of unknown origin.

Due to the potential presence of previously unrecorded subsurface archaeological remains, there is a low to moderate risk of direct, negative impacts during the construction phase. While the development itself poses minimal cultural heritage risk, cumulative effects arising from other nearby developments may increase the likelihood of disturbing unrecorded features. These cumulative impacts, though currently unquantifiable, may result in permanent loss to the archaeological landscape if such remains are uncovered and preserved by record.

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15.9 Mitigation Measures

15.9.1 Incorporated Design Mitigation

As there are no registered archaeological monuments, architectural structures within the proposed development site, no specific alterations to the layout were required to preserve known heritage features. While the potential for encountering previously unknown subsurface archaeological remains during construction is considered low to moderate, the design includes provision for licensed archaeological monitoring during all groundworks. This precautionary measure will ensure that any unexpected discoveries are promptly identified, recorded, and appropriately managed in consultation with the relevant statutory authorities.

15.9.2 Demolition Phase Mitigation

No significant archaeological, architectural, or cultural heritage effects are predicted during the demolition phase of the proposed development; therefore, no mitigation measures are proposed.

15.9.3 Construction Phase Mitigation

Licenced archaeological monitoring will be conducted during the construction phase. Should archaeological features or deposits be revealed during these investigations, both the National Monuments Service and the Planning Authority will be consulted. All newly identified archaeological sites will be preserved in situ or by record and sufficient time and resources will be allowed to resolve all archaeological matters. Preservation in situ will require the relocation of the element of the development beyond the area of archaeological sensitivity. Preservation by record will require the excavation of the archaeological material and such material will be fully resolved to professional standards of archaeological practice (Policy Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht, and the Islands). This work will be funded by the developer.

15.9.4 Operational Phase Mitigation

No archaeological, architectural or cultural heritage effects are predicted during the operational phase of the proposed development; therefore, no mitigation measures are proposed.

15.10 Residual Impact Assessment

Following the implementation of mitigation measures, including licenced archaeological monitoring during groundworks, the residual impact on cultural heritage is expected to be minimal. While there remains a low to moderate potential for the discovery of previously unknown subsurface archaeological features, the monitoring strategy ensures that any such remains can be properly recorded, assessed, and preserved by record if necessary.

As no known archaeological or architectural heritage assets will be directly affected, and appropriate mitigation is in place to address any unforeseen finds, the overall residual impact on cultural heritage is assessed as neutral to minor negative

15.10.1 Demolition Phase

No residual impacts are anticipated during the demolition phase.

15.10.2 Construction Phase

Residual impacts during the construction phase relate primarily to subsurface ground disturbance. While archaeological testing has not identified any remains, the potential for encountering unknown archaeology cannot be entirely discounted. Residual impacts are therefore considered minimal, particularly given the application of a comprehensive archaeological monitoring strategy under licence, which ensures that any unexpected material can be managed appropriately and in compliance with best practice guidelines.

15.10.3 Operational Phase

No additional ground disturbance is anticipated during the operational phase, and no direct or indirect impacts on cultural heritage features are expected. Accordingly, the residual impact is assessed as neutral.

15.10.4 Cumulative Residual Effects

When considered in conjunction with other proposed or permitted developments in the surrounding area, no significant cumulative residual impacts on cultural heritage are anticipated. This is due to the absence of direct impacts on known heritage assets, the low likelihood of previously unknown archaeological material, and the implementation of standard archaeological mitigation measures across developments. Therefore, the cumulative residual impact is assessed as neutral to minor negative.

15.11 Risk of Major Accidents or Disasters

There are no identified risks of major accidents or disasters relevant to cultural heritage arising from the proposed development. Therefore, there are no significant adverse effects expected on cultural heritage from the vulnerability of the project to major accidents or disasters.

15.12 Worst Case Scenario

The worst-case scenario in terms of cultural heritage would involve the unanticipated discovery of significant subsurface archaeological remains during construction, with potential for damage or destruction before identification and protection. However, the implementation of archaeological monitoring, in accordance with best practice and statutory requirements, ensures that any such discoveries will be identified promptly and subject to appropriate mitigation (e.g., preservation by record). As such, even under a worst-case scenario, the risk to cultural heritage is significantly reduced and managed, and no long-term adverse effects are anticipated.

15.13 Interactions

No significant interactions have been identified.

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15.14 Monitoring

Licenced archaeological monitoring of all groundworks will be carried out by a licensed archaeologist, in accordance with a detailed method statement agreed with the relevant authorities (i.e. the National Monuments Service and the local authority archaeologist). Monitoring will ensure that:

- Any previously unknown archaeological features are promptly identified;
- Appropriate mitigation, including preservation by record, is implemented;
- Compliance with statutory and planning requirements is maintained.

All results of monitoring will be formally reported to the relevant bodies.

15.15 Conclusion

This cultural heritage assessment has identified no known archaeological or architectural heritage constraints on the footprint of the proposed development. While there is a low to moderate potential for the presence of previously unknown subsurface archaeological features, this risk will be mitigated through archaeological monitoring during groundworks. As such, the overall predicted impact on cultural heritage is neutral to minor negative, and any unforeseen impacts will be effectively managed through established mitigation protocols.

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Summary of archaeological excavation from 1970-2024 www.excavations.ie

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CHAPTER SIXTEEN

RISK CHAPTER

Cork City Council Draft Development Plan 2022-2028 Consultation Purposes Only!

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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CHAPTER SIXTEEN

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CHAPTER 16 | Risk Chapter

16.1 Introduction

This chapter of the EIAR assesses the vulnerability of the proposed development to be affected by major accidents and disasters (MA&D). It includes an assessment of the potential of the proposed development to cause an increased risk of MA&D, and the likely significant adverse effects arising from potential MA&D.

16.2 Expertise & Qualifications

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master's in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 3 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR's, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, including a Large-Scale Residential Development located on Mountain Road, Carrigaline, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

16.2.1 Scope of Assessment

The specific objectives of this assessment are as follows:

The relevant legislation that applies to this chapter is the Planning and Development Regulations 2001 as amended, and in particular Schedule 6 – Information to be contained in EIAR. The following paragraph of Schedule 6, Paragraph 2(e)(i)(IV), specifically refers to "*a description of the likely significant effects on the environment of the proposed development resulting from … the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)*".

Paragraph 2(h) further expands with "*a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events*."

The Health and Safety Authority (HSA) is the Competent Authority in Ireland as defined by Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, (COMAH Regulations 2015) which implements the Seveso III Directive in Ireland. The HSA is responsible for ensuring that the impacts of facilities which fall within the remit of this legislation are taken into account with respect to land use planning.

The HSA does not currently consider the proposed development to be a COMAH facility. However, in order to ensure a comprehensive assessment of potential environmental effects due to risks of major accidents and/or disasters as relevant to the development, this chapter presents a review of the characteristics of the proposed development and of the project location to consider potential for accident scenarios that do not fall under COMAH reporting requirements.

16.3 Methodology

In the EIA assessment, consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that attribute.

The principal attributes (and impacts) to be assessed include the following:

- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any).
- Potential Seismic Activity (if any).
- Proximity to any COMAH/SEVESO sites.

COMAH/Seveso sites are defined as industrial sites that, because of the presence of dangerous substances in sufficient quantities, are regulated under the Seveso III Directive.

16.3.1 Legislative Context and/or Source of Guidance

Cognisance has been taken of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022). This document follows the requirements laid out in the Directive 2014/52/EU.

Specifically, the EPA Guidelines state that the EIAR must take account of "*the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk)… The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g., the potential effects of floods on sites with sensitive plants. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required. The EIAR should refer to those separate assessments while avoiding duplication of their contents*."

16.3.2 Major Accidents

A major accident can be defined as an acute or chronic accident or disaster, of human or natural origin, which occurs either as a consequence of, or which interacts with, the construction or operation of the proposed Scheme, and which has substantial consequences for people or the environment.

The Seveso III Directive (2012/18/EU) also requires Member States to apply land-use or other relevant policies to ensure that appropriate distances are maintained between residential areas, areas of substantial public use and the environment, including areas of particular natural interest and sensitivity and hazardous establishments (commonly referred to as Seveso sites). For existing establishments, Member States are required to implement, if necessary, additional technical measures so that the risk to persons or the environment is maintained at an acceptable level.

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The Health and Safety Authority (HSA) is the Competent Authority in Ireland as defined by Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, (COMAH Regulations 2015) which implements the Seveso III Directive in Ireland. The HSA is responsible for ensuring that the impacts of facilities which fall within the remit of this legislation are taken into account with respect to land use planning.

Table 16.1 Description of Impacts and Effects

Ref.	Category		Classifications (EPA EIAR Primer Table 3.3)
1.	Quality of Effects	Whether the effect is positive, negative or neutral	Positive, neutral, negative/adverse
2.	Significance	The degree of change relative to existing environmental conditions	Imperceptible, not significant, slight effects, moderate effects, significant effects, very significant, profound effects.
3.	Extent & Context	The area over which an effect occurs and if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent**: the size of the area, the number of sites, and the proportion of a population affected by an effect. **Context**: whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions.
4.	Probability	The likelihood at which an effect could occur	Likely, unlikely.
5.	Duration	The time for which the effect occurs	Momentary, brief, temporary, short-term, medium term, long term, permanent, reversible. Frequency (once / rarely / occasionally / frequently / constantly.
6.	Types of Effects	Impacts on the environment	Direct, indirect, cumulative, 'do-nothing', worst case, indeterminable, irreversible, residual, synergistic.

16.4 Proposed Development

A comprehensive description of the proposed development is presented in Chapter 2 of this EIAR. To summarise, the applicant seeks permission for the following Large-Scale Residential Development (LRD) comprising the construction of 246 no. residential units, 1 no. creche and all associated ancillary development works at Waterfall Road, Ardarostig (Townland), Bishopstown, Cork.

16.5 Description of Existing Environment

16.5.1 Site Description

The site, which is 5.76 hectares in area, with a net developable area of 4.8 hectares, is located along Waterfall Road, in the townland of Ardarostig, Bishopstown, Cork.

The subject land is predominantly a greenfield site. The site is bounded by the N40 and 4 no. dwellings to the north, light industrial uses to the east, agricultural land to the south and a residential development (Waterfall Heights) to the west, which is currently under construction. A primary healthcare centre is also permitted on lands to the east.

16.5.2 Topography

The site slopes down from south to north. The site has a high point on the southern boundary 35.5m Malin Head Datum and a low point of 17.5m Malin Head datum at the northern boundary, adjacent to the roadside footway.

16.5.3 Flood Risk

The National Flood Hazard Mapping Website Flood Maps - Floodinfo.ie does not show any records of historic flooding occurring at the proposed development site. However, it does show instances of historic flooding within close proximity of the site. The recurring flooding occurs to the northwest of the site when the Curraheen River burst its banks. There has also been historical fluvial flooding of the Twopot River which flooded the University Technology Park to the north-west of the site in Curragheen in 2012 and flooding of the Dunnes Stores car park to the east of the site in 2012 as a result of fluvial flooding of the adjacent Glasheen River in 2009.

The subject site does not have any history of flooding. A Site-Specific Flood Risk Assessment has been carried out by OSL Butler Consulting Engineers and is submitted under separate cover. The following is the summary of the flood risk assessment:

- The site including all proposed residential dwellings is located in Flood Zone C as defined by the requirements of "The Planning System and Flood Risk Management, Guidelines for Planning Authorities" and its Technical Appendices.
- Following the Flood Risk Assessment Stage 2 (Initial Flood Risk Assessment), it was determined that a Justification Test was not required.
- To prevent any potential of flooding within the vicinity from the proposed development, it is proposed to implement SuDS measures as discussed in the Infrastructure Report and Drainage Impact Assessment in order to limit the discharge from the site to the current discharge rates. The implementation of these SuDS measures will not increase the risk of flooding elsewhere. It is considered that the proposed development will have a negligible impact on the potential flood regime of the area.
- In conclusion, the proposed development is considered to have the required level of flood protection up to and including the 1% AEP storm event.

The National Flood Hazard Mapping Website Flood Maps - Floodinfo.ie does not show any records of historic flooding occurring at the proposed development site. However, it does show instances of historic flooding within close proximity of the site. The recurring flooding occurs to the north west of the site when the Curraheen River burst its banks. There has also been historical fluvial flooding of the Twopot River which flooded the University Technology Park to the north-west of the site in Curragheen in 2012 and flooding of the Dunnes Stores car park to the east of the site in 2012 as a result of fluvial flooding of the adjacent Glasheen River in 2009.

16.5.3.1 Tidal Flood Risk

The CFRAMS Map in shows that the proposed development site lies outside of the 0.1% AEP coastal flood event and hence is located within Flood Zone C for tidal flood risk, where the risk of flooding is low.

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16.5.3.2 Fluvial Flood Risk

The CFRAMS Map indicates that the proposed development site lies outside of the 0.1% AEP fluvial flood event and hence is located within Flood Zone C for fluvial flood risk, where the risk of flooding is low.

16.5.3.3 Groundwater Flood Risk

The PFRA flood mapping does not indicate any Groundwater flood zones within or immediately adjacent to the boundary of the proposed development. Groundwater risk is therefore not considered to be significant.

16.5.3.4 Pluvial Flood Risk

The Flood Maps data shows no indication of previous pluvial related flooding at the site. During extreme rainfall events the application of SuDS principles will ensure surface water is managed sufficiently and sustainably discharged to the drainage network in accordance with the GDSDS. With these mitigation measures in place pluvial flood risk is not considered to be significant.

16.5.4 Seismic Activity

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating the slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result.

In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics, Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland including IWEX on Carrickbyrne Hill, Co. Wexford, running from 01/01/2011 and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events.

As can be seen in Figure 16.1 below, the principal events have occurred along/ beyond the east, south-east and south of Ireland with seismic movements generally up to 2.9 Magnitude recorded on land with no large seismic events recorded in the immediate vicinity of the subject site.

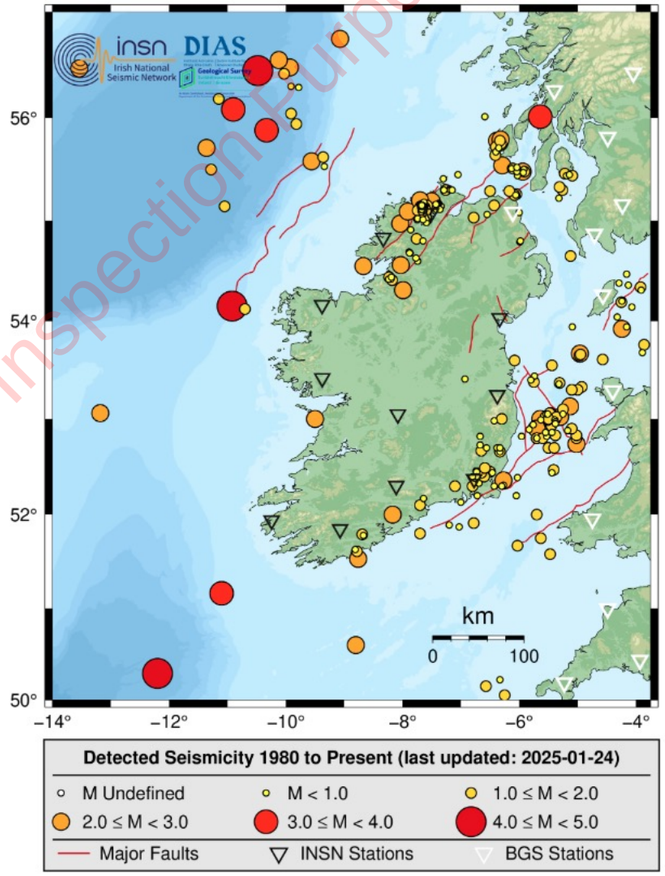


Figure 16.1 Seismic Movements. Source: Irish National Seismic Network

16.5.5 COMAH/SEVESO Sites

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the latest Seveso III Directive (2012/18/EU).

The purpose of the COMAH Regulations is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

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There are two tiers of establishment, which are related to the quantities of dangerous substances present. Depending on quantity, an establishment may be upper-tier or lower-tier. Upper-tier establishments have greater quantities of dangerous substances present and therefore are obliged to comply with additional requirements specified in the Regulations. Lower-tier establishments have lower quantities of dangerous substances present.

There are 6 no. Seveso sites (3 no. lower tier and 3 no. upper tier) located in the Cork City Council administrative area.

The closest Seveso site to the subject site is Irish Oxygen Limited located on the Waterfall Road which is a 'lower tier establishment' and is c.500m (at its nearest point) from the site, with a substantial residential development (Waterfall Heights) separating the subject site and the Seveso site.

The most recent COMAH inspection of the premises was in August 2024. According to the published report detailing this inspection, in accordance with HSA Regulations, in the event of an emergency information for Irish Oxygen Limited states the following:

> *"Members of the public likely to be affected will be warned by the Gardaí or Fire Service."*

It is important to note that there have been two recent planning applications for large scale residential developments, located closer to the Irish Oxygen Limited Seveso site, which were both granted planning permission by An Coimisiún Pleanála (ACP) under ref.s 310274 and 321949. In their submissions on both applications, the Health and Safety Authority did not advise against the granting of planning permission.

Since the 310274 and 321949 permissions were granted, there has been no further development/intensification of the Irish Oxygen premises and given the greater separation distance to the subject site, there is less risk associated with the proposed LRD development than the developments previously permitted under ACP ref.s 310274 and 321949.

Given the low risk and 'lower tier' nature of the Irish Oxygen premises and the separation distance to the proposed development, it is not considered a concern for the proposed development at construction or operational phase.

The proposed development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (S.I. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016 (S.I. 299 of 2007, S.I. 445 of 2012, S.I. 36 of 2016) as amended and associated regulations.

16.6 Environmental Receptors

The EIAR chapters within this report identify that the proposed development has been designed in accordance with best practices and that it can be safely undertaken without risk to health.

In order to understand the potential consequences and predicted impacts of any major accident or disaster due to the proposed development and the vulnerability of the project a desk study was undertaken. The assessment reviewed:

- The vulnerability of the project to major accidents or disasters.
- The potential for the project to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology has been used including the following phases:

Phase 1: Assessment

The Department of Defence consolidated List of National Hazards was used to identify a preliminary list of potential major accident and disasters. Receptors covered by legislation were not included within the assessment, for example, the quarry operatives.

Phase 2: Screening

The list was screened, and major events caused by geological faults or natural phenomena were not included given the unlikely event of one occurring. Elements already addressed as a key part of the design e.g. risks of building collapse, are not repeated.

Phase 3: Mitigation and Evaluation

In the event that mitigation measures included did not mitigate against the risk, then, the potential impacts on receptors are identified in the relevant chapter. Table 16-2 lists the major accidents and/or disasters reviewed.

Table 16.2 Review of Potential Major Accidents and/or Disasters

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Civil				
Large Crowd Event (An event with over 5,000 people)	N	Not considered vulnerable due to the nature of the Proposed Development i.e., a residential development including 246 no. units, and 1 childcare facility	N/A	N/A
Water Supply Contamination	Y	Waterborne diseases can be caused by consuming contaminated drinking water. No public health issues have been identified for the Proposed Development.	Local water users	Chapter 10 Water and Hydrology of this EIAR identifies the control measures required to avoid contamination of water supplies
Food Chain Contamination	N	Not considered vulnerable	N/A	N/A
Animal Disease	N	Not considered vulnerable	N/A	N/A
Terrorist Incident	N	Not considered vulnerable	N/A	N/A

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Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Transportation				
Maritime Incident	N	The closest port is Cork Port which is located approximately 6km east of the site.	N/A	N/A
Air Incident	N	The closest airport is Cork airport located approximately 3.5km southeast	N/A	N/A
Transport Hub (Includes Airports, Ports and Rail Stations)	N	The closest airport is Cork airport located approximately 3.5km southeast	N/A	N/A
Natural				
Cultural, Archaeological and Architectural Heritage	N	There are no sites listed on the Sites and monuments Record (SMR) or the National Inventory of Architectural Heritage (NIAH) relative to the site. The site is not located in an Architectural Conservation Area.	Cultural Heritage	Chapter 15 Cultural Heritage of this EIAR assesses impact of the Proposed Development on the Archaeological and Cultural Heritage and proposes mitigation measures where required. No archaeological, architectural or cultural heritage effects are predicted as a result of major accidents and/ disasters.
Landslides	N	Geological Survey Ireland (GSI) has mapped the area as being of “Made” ground and is not located in an area with landslide susceptibility.	Residents, service users, members of the public and nearby properties	Chapter 9 Land and Soils of this EIAR assessed the vulnerability of the Proposed Development to landslides. According to the GSI map viewer (GSI, 2021), there are no geo-hazards (Landslides) at the site within the 2km study area. The closest site with event ID - GSI_LS12-0327 is located 7.1km to the southeast.
Earthquakes	N	Earthquakes are not likely to occur in the vicinity of the site at a sufficient intensity to pose a risk for the Proposed Development.	N/A	N/A
Floods/ Storm surge/tidal flooding	Y	The site is classified as Flood Zone C, where the probability of flooding is low, and the Proposed Development does not require a justification test as it falls outside Flood Zones A and B.	Proposed Development and surrounding developments.	Chapter 10 Water and Hydrology of this EIAR identifies the vulnerability of the project to flooding. There is no identified risk of flooding at the site of the Proposed Development.
Severe weather such as storms, blizzards, droughts, tornados, heatwaves	N	Not considered vulnerable. In the event of severe weather events, the national meteorological service, Met Éireann, provides advance notice of severe weather, usually several days in advance. When appropriate, colour-coded weather warnings are issued. The Office of Emergency Planning works with the government departments and other key public authorities in order to ensure the best possible use of resources and compatibility across different emergency planning requirements.	N/A	N/A
Air Quality events	Y	Dust emissions during the construction phase and vehicular emissions during the construction and operational phase.	Residents/ workers	Chapter 13 (Air Quality) of this EIAR identifies the impact of the construction and operation of the development on ambient air quality.

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Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Wildfires	N	Not considered vulnerable to wildfires.	N/A	N/A
Fire	N	The risk of fire may lead to loss of life.	Residents, service users, members of the public and nearby properties.	A fire evacuation strategy will be put in place in advance of occupancy. Access routes serving the Proposed Development have been designed to provide adequate space for the Fire Brigade.
Invasive species	Y	There are no recorded third schedule invasives species recorded on the site	N/A	Chapter 11 (Biodiversity) of this EIAR identifies the assessment of invasive species on site and any mitigation measures required.
Technological				
Structural Collapse (Building)	N	The design criteria of the buildings will be in accordance with all relevant building de-sign standards. No further assessment is required.	N/A	N/A
Structural Collapse (Dam, Bridge, Tunnel)	N	Not considered vulnerable as no dams, bridges or tunnels are proposed as part of the development.	N/A	N/A
Nuclear incident	N	Not considered vulnerable.	N/A	N/A
Cyber incident	N	Not considered vulnerable.	N/A	N/A
Disruption of energy supply (oil, gas, electricity)	N	Not considered vulnerable. ESB Networks maintain the electricity network in Ireland. Gas Networks Ireland maintain the natural gas network in Ireland.	N/A	Chapter 7 Material Assets contains information on energy supply
Utilities failure (Water)	N	Not considered vulnerable	N/A	Chapter 10 Water and Hydrology and Chapter 7 Material Assets – Utilities contains information on water supply
Utilities failure (Communication)	N	Not considered vulnerable. In Ireland, the fixed-line communications market is dominated by Eir; while Eir, Three, and Vodafone own Ireland's mobile telecommunications infrastructure.	N/A	Chapter 7 Material Assets – Utilities contains information on communications
Utilities failure (wastewater, sewage)	N	Not considered vulnerable	N/A	Chapter 7 Material Assets contains information on wastewater management
Utilities failure (solid waste)	N	Not considered vulnerable	N/A	Chapter 8 Material Assets contains information on waste management
Industrial accidents (defence, energy, oil and gas refinery, food industry, chemical industry, manufacturing, quarrying, mining)	Y	The closest Seveso site to the proposed development Irish Oxygen Company Ltd., is a lower tier site (approx. 500m south-west).	N/A	According to the latest inspection report of Oxygen Company Ltd, carried out by the HSA, in the event of an emergency, members of the public likely to be affected will be notified by the gardai or fire service.

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16.7 Predicted Impacts

The potential impacts of the construction and operational phases of the Proposed Development are outlined below.

16.7.1 Do Nothing Scenario

The site will remain as underutilized greenfield area.

16.7.2 Construction Phase

No scenarios of concern have been identified during the construction phase. As such the predicted impact is considered to be short term, imperceptible and neutral.

16.7.3 Operational Phase

The proposed development is not located in an area prone to flooding or an area prone to seismic events or within close proximity to a COMAH/Seveso site. As such, these accident scenarios are not of concern.

16.7.4 Cumulative Effects

Cumulative impacts are considered imperceptible and neutral.

16.8 Mitigation Measures

Cumulative impacts are considered imperceptible and neutral.

16.8.1 Construction Phase

No mitigation measures necessary.

16.8.2 Operational Phase

Mitigation measures have been designed into the proposal. No further mitigation measures necessary.

16.8.3 Monitoring

No monitoring proposed.

16.9 Residual Impacts

Control measures will be put in place for health and safety and environmental management as per conditions of the planning permission, relevant code of practices and relevant legislation. The residual impacts will be negligible once all control, mitigation and monitoring measures have been implemented. The potential for dust or noise from the site operations to cause any nuisance to nearby receptors is deemed to be negligible and the adherence and full implementation of the appropriate control and mitigation measures will ensure there is no potential for cumulative effects to arise.

16.10 References

- Department of Defence ‘National Risk Assessment for Ireland 2023’ (2023).
- EPA ‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports’ (2022).
- EPA ‘Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements’ (2015).
- National Roads Authority (NRA) ‘Guidelines on Procedures for the Assessment and Treatment of Hydrology for National Road Schemes’ (2009).
- Office of Public Works (OPW, www.floodinfo.ie).
- Irish National Seismic Network (INSN, www.insn.ie)
- Engineering Report prepared by OSL Butler Consulting Engineers.
- Flood Risk Assessment prepared by OSL Butler Consulting Engineers.

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CHAPTER SEVENTEEN

INTERACTIONS OF THE FOREGOING

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CHARTERED PLANNING CONSULTANTS

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CHAPTER SEVENTEEN

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CHAPTER 17 | Interactions of the Foregoing

17.1 Introduction

The construction, operational and cumulative impacts of the proposed development have been assessed within each chapter of the EIAR. This chapter considers the significant interactions of impacts between each of the separate disciplines.

In practice many impacts have slight or subtle interactions with other disciplines. This chapter highlights in Table 17.1 (located at the end of this section) those interactions which are considered to potentially be of a significant nature. Discussions of the nature and effect of the impact is primarily undertaken within each of the relevant chapters, while this chapter identifies the most important potential interactions.

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants with input from the lead author of each assessment.

17.2 Population and Human Health

Chapter 4 assesses the likely impacts to Population and Human Health arising from the proposed development.

During the construction phase, the following aspects have potential to interact with population and human health:

- Material Assets – Traffic and Transport: Construction traffic creates potentials incidents, including an increase in pollutants which may affect air quality. This could lead to potential impacts on health and safety.
- Land and Soils: There is a potential risk of dust generated from excavation and stockpiling of soil during the construction phase of the proposed development posing a human health risk in the absence of standard avoidance and mitigation measures.
- Material Assets – Waste: The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers.
- Water and Hydrology: The construction phase could result in potential pollution events which could impact water quality and therefore human health of the surrounding population.
- Noise and Vibration: The construction phase could give rise to increased noise and vibration which may impact on the amenity of existing local residents.
- Air Quality: Construction activities may impact the local air quality which has the potential to impact human health.
- Landscape and Visual: The construction phase would result in the presence of construction equipment on site which may result in visual changes.

During the operational phase, the following aspects have potential to interact with population and human health:

- Landscape and Visual: There will be permanent visual changes to the landscape which may impact the residential dwellings in the surrounding area.
- Traffic and Transport: At operational stage, the development will result in increased traffic which has the potential to impact negatively on local residents and receptors.

The potential significant impacts to Population and Human Health have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.3 Landscape and Visual

Chapter 5 assesses the likely potential impacts on landscape and any visual impacts arising from the proposed development

During the construction phase and operational phase, the following aspects have potential to interact with landscape and visual:

- Cultural Heritage: Cultural Heritage may interact with the Landscape and Visual amenity offered in this location
- Biodiversity: Biodiversity chapter may interact with the Landscape and Visual amenity offered in this location, including the proposed landscaping and planting proposed as part of enhancement and replacement of loss of existing vegetation.

The potential significant impacts to Landscape and Visual have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.4 Material Assets: Traffic and Transport

Chapter 6 assesses the likely impact on Traffic and Transport arising from the proposed development. During the construction and operational phase, the following aspects have potential to interact with traffic and transport:

- Population and Human Health: The construction phase of the development has the potential to cause risk to public health due to greater traffic volumes and potential worsening of air quality which can impact human health. During the operational phase, traffic volumes will increase and this will pose potential risk to human safety.
- Air Quality: There is potential that air quality can be worsened during the construction phase and operational phase, due to increases in traffic volumes.
- Biodiversity: There is potential for disruption to wildlife during the construction and operational phase due to increased traffic volumes.
- Noise and Vibration: There is potential for increased noise and vibration during the construction and operational phases due to increased traffic volumes.

The potential significant impacts to Traffic and Transport have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.5 Material Assets: Built Services

Chapter 7 assesses the likely impacts on Services and Infrastructure arising from the proposed development. During the construction phase and operational phase, the following aspects have potential to interact with built services:

- Water and Hydrology: The likely interactions between Material Assets and other environmental factors include interactions between the proposed drainage and wastewater arrangements and Chapter 10: Water and Hydrology of this EIAR.

The potential significant impacts to Built Services have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

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17.6 Material Assets: Waste

Chapter 8 assesses the likely impacts on Waste arising from the proposed development. During both the construction and operational phases, the following aspects have potential to interact with waste.

- Population and Human Health: There are potential impacts on human health in the event of incorrect management of waste during both construction and operational phases.
- Traffic and Transport: Local traffic may be impacted by additional vehicle movements generated by the removal of waste from the site during the construction and operational phases.
- Land and Soils: During the construction phase, excavated soils and stone will be generated from the site. While excavated material is planned to be reused on site, there is potential that this material may need to be taken offsite for disposal.
- Biodiversity: The potential impacts on biodiversity in relation to the generation of waste during the construction or operational phases are that the incorrect management of waste could result in littering, pollution issues or vermin in areas affected.

The potential significant impacts to Waste have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.7 Land and Soils

Chapter 9 assesses the likely impacts on Land and Soils arising from the proposed development. During the construction phase, the following aspects have potential to interact with land and soils:

- Water and Hydrology: Surface water effects are directly linked with hydrogeology or groundwater effects, with surface water pathways leading to groundwater and vice versa. Surface water runoff can also have an effect on soil quality in the area, with chemicals or suspended solids having an effect on soil fertility and contamination.
- Biodiversity: Interactions with biodiversity can occur through the spread of hazardous materials or contaminated land during construction. The spread of materials found in the soils (trace amounts of asbestos, lead, or hydrocarbons) could lead to habitat degradation, either on site or downstream through groundwater pathways.
- Traffic and Transport: The removal of material from the site will require vehicles using the road network in the area.

The potential significant impacts to Land and Soils have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.8 Water & Hydrology

Chapter 10 assesses the likely impacts on Water and Hydrology arising from the development. During the construction and operational phase, the following aspects have potential to interact with water & hydrology:

- Biodiversity: Dust emissions have the potential to settle on plants causing impacts to local ecology. Mitigation measures during the construction phase of the proposed development will ensure that dust generation is minimised and the effect on biodiversity will be short term, imperceptible and neutral. There is potential for impacts to biodiversity associated with uncontrolled discharges to surface waters during operational phase.
- Land and Soils: Surface water runoff can also have an effect on soil quality in the area, with chemicals or suspended solids having an effect on soil fertility and contamination.
-

The potential significant impacts to Water and Hydrology have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.9 Biodiversity

Chapter 11 assesses the likely impacts on Biodiversity arising from the development. The potential significant impacts to Biodiversity have been considered within the relevant disciple and mitigation measures outlined where required. With mitigation measures in place, no significant impacts are predicted during the construction and operational phases of the development.

17.10 Noise and Vibration

Chapter 12 assesses the likely impacts on Noise and Vibration arising from the proposed development. During the construction and operational phases, the following aspects have potential to interact with noise and vibration:

- Population and Human Health: Noise arising from the construction phase of the development can impact the amenity of local residents.
- Traffic and Transport: Increased traffic volumes during both construction and operational phases can result in increased noise and vibration.
- Biodiversity: Increased noise and vibration as a result of the construction phase could impact on local wildlife.

The potential significant impacts to Noise and Vibration have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.11 Air Quality

Chapter 13 assesses the impacts on Air Quality arising from the development. During the construction and operational phases, the following aspects have potential to interact with air quality.

- Population and Human Health: An adverse air quality impact during the construction phase can cause health and dust nuisance issues. During the operational phase, vehicles accessing the site will emit pollutants which may impact Air Quality and Human Health.
- Climate: Air Quality and Climate have interactions as the emissions from the burning of fossil fuels during the construction and operational phases generate both air quality and climate impacts. There is no impact on climate due to air quality. However, the sources of impacts on air quality and climate are strongly linked.
- Land and Soils: Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality and Land & Soils in the form of dust emissions.
- Biodiversity: Dust generation can occur during extended dry weather periods due to construction traffic along haul routes and construction activities such as excavations and infilling works. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability as well as other effects
- Traffic and Transport: Interactions between Air Quality and Traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase.

The potential significant impacts to Air Quality have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

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17.12 Climate

Chapter 14 assesses the impacts on Climate arising from the development. During the construction and operational phases, the following aspects have potential to interact with climate:

- Land and Soils: The impact of climate change could result in increased flooding and rainfall which has the potential to impact the proposed development. The impact of flood risk has been assessed, and the surface water drainage network will be designed to cater for increased rainfall in future years as a result of climate change.
- Air Quality: Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts.
- Traffic and Transport: During the construction and operational phase, there is the potential for interactions between climate and traffic. Vehicles accessing the site will result in emissions of CO_2, a greenhouse gas.
- Waste: Improper waste disposal during both construction and operational phases can create a climate impact.

The potential significant impacts to Climate have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.13 Cultural Heritage - Built Heritage Architectural and Archaeology

Chapter 15 assesses the impacts on Cultural Heritage arising from the development. The potential significant impacts to Cultural Heritage have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

17.14 Conclusion

Table 17-1 below provides an overview of the above interactions. Potential interactions are presented by an 'X'. Columns without an 'X' indicates that no interaction is expected. An 'X' in the columns headed 'C' represent interactions expected in the construction phase while an 'X' in the columns headed 'O' represent interactions expected in the operational phase.

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Table 17.1 Interactions with Potential for Significant Impacts Before the Implementation of Mitigation Measures

Interaction	Population & Human Health		Landscape		Material Assets-Traffic		Material Assets-Built Services		Material Assets: Waste		Land & Soils		Water		Biodiversity		Noise & Vibration		Air Quality		Climate		Cultural Heritage	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con	Op	Con.	Op.
Population & Human Health			X	X	X	X			X		X		X				X		X					
Landscape and Visual															X	X							X	X
Material Assets-Traffic	X	X													X	X	X	X	X	X				
Material Assets-Built Services													X	X										
Material Assets: Waste	X	X			X	X					X				X	X								
Land & Soils					X	X							X	X	X				X					
Water and Hydrology											X	X			X	X								
Biodiversity					X	X	X	X			X		X				X		X					
Noise & Vibration	X				X	X									X									
Air Quality	X	X			X	X			X	X	X				X						X	X		
Climate					X	X				X	X								X	X				
Cultural Heritage																								

Con. - Construction Phase | Op. - Operational Phase |

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CHAPTER EIGHTEEN

SUMMARY OF MITIGATION MEASURES

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McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

Cork City Council Planning Department. For Inspection Purposes Only!

CHAPTER EIGHTEEN

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CHAPTER 18 | Summary of Mitigation Measures

18.1 Introduction

A key objective of the Environmental Impact Assessment process is to identify likely significant environmental impacts at the pre-consent stage and where necessary to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR summarises the proposed mitigation measures set out in Chapters 4 to 15.

All the mitigation measures proposed within the individual specialists' assessments will be incorporated into the Construction and Environmental Management Plan (CEMP) prior to works commencing on-site.

Table 18.1 Summary of Incorporated Design Mitigation Measures

Aspect	Mitigation
Population & Human Health	The proposed development complies with the Building Regulations which provide for the safety and welfare of people in and about buildings. The Building Regulations cover matters such as structure, fire safety, sound, ventilation, conservation of fuel and energy, and access, all of which safeguard users of the buildings and the health of occupants. The proposed design provides for the segregation of pedestrians and bicycle traffic from motorised traffic. The design also incorporates the principles of universal design and the requirements of Part M of the Building Regulations so that the development will be readily accessible to all, regardless of age, ability or disability. The integration of energy efficient measures into the design will provide for healthier living standards for future occupants, less dependence on fossil fuels and associated improved air quality. The availability of on the doorstep public open space, amenity spaces, and a highly accessible layout across the scheme will encourage sustainable modes of outdoor access for a wide age group.
Landscape & Visual	No incorporated design mitigation measures are proposed as part of the proposed development.
Material Assets: Traffic & Transport	The design incorporates enhanced pedestrian crossings, and traffic calming measures in line with DMURS (2019).
Material Assets: Built Services	All new-build service infrastructure is to be designed in accordance with the relevant service provider and asset owner's code of practice, which require due cognisance of the receiving environment. Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided where possible, and by association a reduction in resultant waste and machinery operation time. It is proposed that products and materials are supplied locally, where practicable and available, in order to reduce carbon footprint of travel and production.
Material Assets: Waste	A number of measures will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment. The concept of the 'Waste Hierarchy' and 'Circular Economy' is employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The circular economy principle aims to keep materials, components, and products in-use in the economy for as long as possible. In circularity, the key objective is to design consumption and production systems to create and retain value. Both principles have been applied and will further be applied during the detailed design, construction and operational phases.
Land & Soils	No incorporated design mitigation measures are proposed as part of the proposed development
Water & Hydrology	No incorporated design mitigation measures are proposed as part of the proposed development
Biodiversity	Green infrastructure is incorporated into the design of the Proposed Development. The inclusion of native species will enhance biodiversity overall with provision of native shrubs, trees and sustainable surface water drainage methods as outlined in the landscape strategy prepared by SRLA (2025).
Noise & Vibration	No incorporated design mitigation measures are proposed as part of the proposed development
Air Quality	No incorporated design mitigation measures are proposed as part of the proposed development

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Aspect	Mitigation
Climate	A number of measures have been incorporated into the design of the development to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (Section 14.7.2.2). In relation to operational energy usage information from the Climate Action and Energy Statement prepared for the proposed development has been used to inform this assessment. The proposed development will be Nearly Zero Energy Building (NZEB) compliant in line with the Technical Guidance Part L (2022) of the Building Regulations requirements for the residential elements and Technical Guidance Part L (2022), Buildings other than Dwellings for the creche. As per the Climate Action and Energy Statement he following key elements will be included in the design parameters. Maximise the passive elements of the design by: • Specifying building fabric insulation u-values better than the Part L 2022 Regulations. • Targeting the air permeability to be ≤ 3m3/m2/hr @ 50Pa Using the DEAP Software to optimise the façade using differing glazing u-values, light transmittance and solar gain ('g' values). • Ensuring particular detailing of linear thermal bridging. • Maximising the active elements of the design by: Specifying lighting designs that deliver > 90 lumen/ circuit watt • Specifying lighting systems with occupancy and daylight controls in Landlord areas. • Specifying high efficiency Heating systems • Minimise the specific fan power where applicable The proposed development will incorporate renewable technologies to improve on the RER of 20% specified in the NZEB requirements. Renewable energy options include solar PV panels, ground source heat pumps, air source heat pumps and exhaust air heat pumps. Additionally, the Climate Action Energy Statement has considered the following in relation to reduce, where possible, the embodied carbon impact of the proposed development: • Reduce the weight of equipment. • Specify products that can be demounted and reused. • Specify products with long lifespans. • Mitigate refrigerant impact through low refrigerant Global Warming Potential (GWP) and leakage rates. • Plant should be easily accessible for inspection, maintenance and replacement. • Design with adaptation in mind. • Less is more, design out MEP. • Source local materials where possible. • Source materials with an Environmental Product Declaration (EPD) where possible These identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals of the Climate Action Plan.
Cultural Heritage	As there are no registered archaeological monuments, architectural structures within the proposed development site, no specific alterations to the layout were required to preserve known heritage features. While the potential for encountering previously unknown subsurface archaeological remains during construction is considered low to moderate, the design includes provision for licensed archaeological monitoring during all groundworks. This precautionary measure will ensure that any unexpected discoveries are promptly identified, recorded, and appropriately managed in consultation with the relevant statutory authorities.

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Table 18.2 Construction Mitigation

Aspect	Mitigation
Population & Human Health	An Outline Construction and Environmental Management Plan (OCEMP), Resource Waste Management Plan (RWMP) and Operational Waste Management Plan (OWMP) for the proposed development are included in the planning application documentation. The OCEMP, RWMP & OWMP will be further updated by the contractor, agreed with Cork City Council prior to commencement, and implemented by the selected contractor after any consent is received. All construction personnel will be required to understand and implement the requirements of the OCEMP and RWMP and shall be required to comply with all legal requirements and best practice guidance for construction sites. The OCEMP provides for a construction phase management structure to ensure that environmental protection and mitigation measures are put in place. The OCEMP requires that these measures will be checked, maintained to ensure adequate environmental protection. The OCEMP also requires that records will be kept and reviewed as required to by the project team and that the records will be available on site for review by the planning authority. All construction personnel will attend induction and training classes as required to ensure that the OCEMP is effectively implemented. The OCEMP will comply with all appropriate legal and best practice guidance for construction sites.
Landscape & Visual	Mitigation measures during the construction phase include the provision of 2.5m palisade walls made of solid timber with no viewing gaps between them surrounding the boundaries of the affected receptor groups.
Material Assets: Traffic & Transport	The following summarises the construction and operational phase mitigation; • Schedule construction traffic outside peak hours. • Implement noise barriers and limit construction hours. • Employ dust suppression techniques (e.g., water spraying). • Establish clear signage and detours for pedestrians. • Implement a Mobility Management Plan to promote sustainable transport options. • Enhance public transport services and facilities (e.g., bus stops, shelters). • Install pedestrian crossings, bike lanes, and safety signage. • Encourage use of electric vehicles and provide EV charging stations. Implement noise-reduction measures (e.g., sound barriers, landscaping).
Material Assets: Built Services	A detailed Construction and Environmental Management Plan (CEMP), in line with the preliminary CEMP submitted as part of this planning application, will be prepared and implemented by the contractor at the construction phase. The following is a summary list of all mitigation measures: • Implement the Construction Environmental Management Plan (CEMP) • Implement the Resources and Waste Management Plan (RWMP) • Liaise with all relevant Statutory Authorities and Service Providers prior to commencement of construction • Create and implement a surface water drainage construction quality control system • Implement the Uisce Eireann Quality Assurance system for construction of wastewater and water supply services • Implement the ESB Quality Assurance system for construction of electrical services infrastructure • Implement the Openeir Quality Assurance system for construction of telecommunication services infrastructure

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Aspect	Mitigation
Material Assets: Waste	The following summarises the Construction and Operational Phase mitigation • The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction phase. • All waste leaving the site will be recorded and copies of relevant documentation maintained • All waste leaving the site will be recorded and copies of relevant documentation maintained
Land & Soils	At Construction Stage the following mitigation measures are proposed: • The measures proposed to be put in place to mitigate any potential damage from the effluent of contaminated ground water will be to create an exclusion zone. • Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site. • Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches. • Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds. • Any lubricants or hydraulic oils will be bunded in bunds that can contain 110% volume of the largest container. Absorbent pig bags will be kept in the site offices. These will be disposed of correctly if used and replaced with new ones immediately. Disposal records for used adsorbent will be retained by the Site Manager; • All materials taken on-site will be clearly labelled and stored in sealable containers; • The diesel fuel tank will be adequately bunded (110%) and the filling nozzle will be stored within the bunded area. The Site Manager will as part of their daily site walkaround check the integrity of the fuel tank(s). The condition of the tanks will be recorded by the Site Manager; • Re-fuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area which will be away from any existing surface water drains which could also provide pathways to the underlying geology; • The contractor will ensure that no hazardous or noxious materials enter a watercourse or drain or open excavation. Should this situation arise emergency procedures will be activated; • During all works the weather forecast will be monitored and a contingency plan developed to prevent damage or pollution during extreme weather. Machinery and equipment will not be left on-site during such events and will be removed beforehand; • Trucks delivering concrete to the site will not be allowed to washout their vehicles on site. Only washing of the chute will be allowed. The washing facilities will be remote from watercourses and will be bunded by a low earthen berm. • The Contractor is to clean equipment prior to delivery to the site. The Contractor is to avoid using any equipment which leaks fuel, hydraulic oil or lubricant. The Contractor is to maintain equipment to ensure efficiency and to minimise emissions; • Should mobilisation of soil particles/pollution be noted in the course of weekly monitoring by the Site Manager, works will stop temporarily, and the Site Manager will initiate the interception and treatment of pollution/silt run-off; • Precast elements should be maximised to avoid wet concreting in close proximity to water. • Discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. • Surface water runoff will be collected, a temporary positive drainage system shall be installed prior to the commencement of the construction works • A series of geotextile lined cascading, high level outfall, settling basins will be installed upstream of the agreed discharge point by the appointed contractor. • Alternatively, a 'siltbuster' silt control unit can be used on the outfall. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed before water is discharged in a controlled manner to the agreed outfall. • All inlets to the cascading settling basins will be riprapped to prevent scour and erosion in the vicinity of the inlet. There will be: » Minimisation of site disturbance » Implementation of sediment control (as outlined above) » Minimisation of the potential for erosion » Prevention of sediment-contaminated water leaving the site • All soil stockpiles will be covered (vegetated or with tarpaulins/similar material) to minimise the risk of rain runoff/wind erosion. Vegetation will be established as soon as possible on all exposed soils.

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Aspect	Mitigation
Water & Hydrology	The following mitigation measures will be implemented during the construction phase. ***Mitigation associated with sediment and sediment runoff*** • During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the excavation site which limits the potential for any offsite impacts. • Silt reduction measures on site will include a combination of silt traps and hydrobrakes measures. • Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only. • Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination. • Movement of material will be minimised to reduce the degradation of soil structure and generation of dust. • Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations. • Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site. • Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil and aquifer. • Wash-outs will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker. • The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. Relevant personnel working on the site will be suitably trained in the implementation of the procedures ***Mitigation associated with spillages to ground of fuels and other construction chemicals*** • Designation of bunded refuelling areas on the site; • Provision of spill kit facilities across the site; • Where mobile fuel bowsers are used, the following measures will be taken: • Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use; • The pump or valve will be fitted with a lock and will be secured when not in use; • All bowsers to carry a spill kit and relevant operatives must have spill response training; • Portable generators or similar fuel containing equipment will be placed on suitable drip trays. In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted: • Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area; • Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal. • Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage; • All drums to be quality approved and manufactured to a recognised standard; • If drums are to be moved around the Site, they will be secured and on spill pallets; and • Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment. • Foul wastewater arising from the site will be managed and controlled for the duration of the construction works. • Foul water from the offices and welfare facilities on the site will be collected in portable sanitary facilities and disposed of appropriately by licenced contractor. • The construction contractor will implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the site will be suitably trained in the implementation of the procedures • Surface water discharge from the site will be managed and controlled for the duration of the construction works until the surface water drainage system of the Proposed Development is complete. • The construction contractor will be required to manage suspended solids during the construction phase and will be permitted to discharge treated construction water to the established stormwater network. • The construction activities will require surface water management to prevent pollution and degradation of habitats from a chemical spill or run off containing excessive suspended solids that complies with guidelines and best practices such as “Control of Water Pollution from Construction Sites and Guidance for Consultants and Contractors” (CIRIA 532, 2001)

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Aspect	Mitigation
Biodiversity	The following mitigation measures will be implemented as part of the Proposed Development and in line with the policy objectives of the Cork Biodiversity Action Plan (2021-2026), in order to minimise the potential impacts on the existing ecology during the construction phase. ***Biodiversity Measures within the CEMP*** • The CEMP (OSL, 2025b) has a number of biodiversity specific measures relating to the construction phase. In consultation with the Project Ecologist, construction phase mitigation is also detailed in the CEMP for the following elements: » Appropriate Lighting for bats and other nocturnal wildlife » Timing of works and vegetation clearance ***Surface Water Protection*** During the Construction Phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (OSL, 2025b). These measures will address the main activities of potential impact which include: • Control and Management of surface water runoff. • Control and management of shallow groundwater during excavation and dewatering. • Management and control of soil and materials. • Appropriate fuel and chemical handling, transport and storage. • Management of accidental release of contaminants at the site. • Control and handling of cementitious materials. The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Good construction management practices will minimise the risk of pollution from construction activities at the subject site including but not limited to: • Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors. • CIRIA, 2015. Environmental Good Practice on Site (C741). • Enterprise Ireland Oil Storage Guidelines (BPGCS005). • Environmental Protection Agency (EPA), 2013. IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities. • CIRIA, 2007. The SuDS Manual (C697). • UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG). • CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648). • Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. ***Timing of Works and vegetation clearance*** Works likely to cause disturbance to nesting birds and resting or hibernating herpetofauna should be timed to take place outside the breeding bird season and in line with best practice i.e. during the period September – February inclusive for birds, See Table 11-32 regarding optimal timings for vegetation clearance for a range of species groups. As shown in Table 11-32, the optimal period for vegetation clearance in an overall context is during September and October. Any clearance of scrub on-Site should take place during the period (February to March inclusive) in line with the strict timing of vegetation clearance stated in the Wildlife Act 1976 and subsequent amendments. All treelines and hedgerows currently in place should be retained and reinforced with native species where practicably possible as part of the Proposed Development. ***Construction Phase Lighting*** Overnight lighting will be minimised as much as possible with any essential overnight lighting directed away from natural habitats along the boundaries of the Site (i.e., the woodland, hedgerows and scrub areas interspersing the Site). Where overnight lighting cannot be avoided in these areas due to health and safety concerns, the lighting within the Proposed Development will be designed and installed to minimise the impact on local wildlife and in accordance with the Bat Conservation Trust guidelines on artificial lighting and bats (BCT 2023)

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Aspect	Mitigation
	Waste Management As best-practice, all construction-related rubbish on-site e.g., plastic sheeting, netting etc. should be kept in a designated area on-site and kept off ground level so as to protect small fauna (such as small mammals) from entrapment and death. ***Pre-Construction Amphibian, Reptile and Mammal Surveys*** Pre-construction surveys will be carried out no more than 3 months prior to Site clearance to assess the likely presence of breeding birds, amphibians, common lizard or small mammals, with particular attention paid to all brash stockpiles and removable hedgerows on Site. ***Reduction of Nise Related Impacts*** Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction/Infill Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. ***Invasive Species Management*** Transport Infrastructure Ireland (2020) guidance 'The Management of Invasive Alien Plant Species on National Roads – Technical Guidance' will be consulted with regards the treatment, removal and disposal of invasive flora at the Site. ***Biosecurity Measures*** For the Construction Phase the contractor will prepare a project specific IAPS standard operating procedure document, in advance of work commencement. The document should be prepared by an IAPS specialist and should cover the bio-security measures to be taken, including the maintenance of records, to screen for the introduction of IAPS onsite, and to enable their tracing if such an introduction occurs; and to ensure no transmission of IAPS offsite.

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Aspect	Mitigation
Noise & Vibration	A suite of noise and vibration control measures will be employed by the contractor during the construction phase. ***Selection of Quiet Plant*** The potential for any item of plant to result in exceedance of construction noise thresholds will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever practicable (e.g., plant items with sound attenuation incorporated. ***Noise Control at Source:*** The following measures will be implemented, by the appointed contractor to control noise at source. These measures relate to specific site considerations: • For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilising an acoustic canopy to replace the normal engine cover and / or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant will be switched off when not in use and not left idling. • For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed; • Where compressors, generators and pumps are located in proximity to NSLs and have the potential to exceed the construction noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation; and • Resonance effects in panel work or cover plates can be reduced through stiffening or the application of damping compounds, while other noise nuisance can be controlled by fixing resilient materials in between the surfaces in contact. ***Screening:*** Screening is an effective method of reducing CNLs at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver. Standard construction site hoarding (2.4 m in height) with a mass per unit of surface area greater than 7 kg/m^2 can provide adequate sound insulation. This is recommended, as a minimum around all site boundaries of the proposed development site. ***Hours of Work:*** Working hours will be restricted to 07:00 to 19:00 Monday to Friday & 08:00 to 16:00 on Saturdays. Sunday or Bank Holiday work will only take place periodically at the agreement with Cork City Council. Similarly, any other out of hours working will be only permitted by arrangement with site management and Cork City Council. ***Liaison with the public*** A designated Community Liaison Officer (CLO) will be appointed to site during construction works ***Monitoring*** During the construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. ***Vibration Control*** Vibration from construction activities will be limited to the values set out in Table 12-3 to avoid any form of potential cosmetic damage to buildings and structures.

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Aspect	Mitigation
Air Quality	The proposed development has been assessed as having a medium risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities. The mitigation measures draw on best practice guidance from Ireland (DCC (2018), DLRCC (2022)), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities. ***Communications*** • Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses. • The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details. ***Site Management*** • During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions. • A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out. ***Preparing and Maintaining the Site*** • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping. • Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period. ***Operating Vehicles / Machinery and Sustainable Travel*** • Ensure all vehicles switch off engines when stationary - no idling vehicles. • Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable. • Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing) ***Operations*** • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. ***Waste Management*** • Avoid bonfires and burning of waste materials.

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Aspect	Mitigation
	Measures Specific to Earthworks • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Only remove the cover in small areas during work and not all at once. • During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust. • Measures Specific to Construction • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust. ***Measures Specific to Construction*** • Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. ***Measures Specific to Trackout*** • A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Record all inspections of haul routes and any subsequent action in a site logbook. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permit. • Access gates to be located at least 10 m from receptors where possible. ***Monitoring*** • Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

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Aspect	Mitigation
Climate	Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. The following measures to reduce the embodied carbon of the construction works are: • Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled. • Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. • Ensure all plant and machinery are well maintained and inspected regularly. • Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. • Sourcing materials locally where possible to reduce transport related CO_2 emissions. • Material choices and quantities will be reviewed during detailed design, to identify and implement any lower embodied carbon options, where feasible. For example a 30% minimum clinker replacement in cement may be utilised in line with the requirements for public bodies. In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements. Throughout detailed design and construction phase, guidance documents to inform with design detail decisions shall be reviewed e.g. the EU Commission *Technical Guidance on Adapting Buildings to Climate Change* (European Commission (2021a), LETI emergency design guide (LETI, 2020), and the latest IPCC report.
Cultural Heritage	Licenced archaeological monitoring will be conducted during the construction phase. Should archaeological features or deposits be revealed during these investigations, both the National Monuments Service and the Planning Authority will be consulted. All newly identified archaeological sites will be preserved *in situ* or by record and sufficient time and resources will be allowed to resolve all archaeological matters. Preservation *in situ* will require the relocation of the element of the development beyond the area of archaeological sensitivity. Preservation by record will require the excavation of the archaeological material and such material will be fully resolved to professional standards of archaeological practice (Policy Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht, and the Islands). This work will be funded by the developer.

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Table 18.3 Operational Mitigation

Aspect	Mitigation
Population & Human Health	The proposed development is of a high quality design that incorporates generously sized units with integrated energy efficiency measures and an abundance of open space. The impact assessment section did not identify likely significant negative environmental impacts on population and human health arising from the operational phase of the proposed development. Accordingly, mitigation measures are not proposed.
Landscape & Visual	During the operational phase, it is recommended to reinforce the existing treelines by including tall tree planting with high content of evergreen species along the boundaries touching the proposed development.
Material Assets: Traffic & Transport	The following summarises the construction and operational phase mitigation; • Schedule construction traffic outside peak hours. • Implement noise barriers and limit construction hours. • Employ dust suppression techniques (e.g., water spraying). • Establish clear signage and detours for pedestrians. • Implement a Mobility Management Plan to promote sustainable transport options. • Enhance public transport services and facilities (e.g., bus stops, shelters). • Install pedestrian crossings, bike lanes, and safety signage. • Encourage use of electric vehicles and provide EV charging stations. Implement noise-reduction measures (e.g., sound barriers, landscaping).
Material Assets: Built Services	• Implement a Surface Water Management and Maintenance Plan • Implement the ESB Quality Assurance system for construction of electrical services infrastructure • Implement the Openeir Quality Assurance system for construction of telecommunication services infrastructure
Material Assets: Waste	The following summarises the Operational Phase mitigation • The Operator / Buildings Manager will ensure that all waste leaving the Site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities. • The Operator / Buildings Manager will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials. The Operator / Buildings Manager will ensure that all waste collected from the Site of the proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available.
Land & Soils	No significant effects are anticipated during the operational phase. Therefore, no mitigation measures have been proposed.

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Aspect	Mitigation
Water & Hydrology	The following mitigation measures will be implemented during the operational phase. • To mitigate potential contamination from surface water runoff, which may originate from roads and hardstanding areas, a sustainable drainage system (SuDS) will be implemented. This system is designed to minimize the risk of contaminants, such as hydrocarbons, entering the stormwater drainage network and subsequently impacting surface water bodies like the Glasheen Stream, Twopot River, Curragheen Rive, as well as groundwater bodies, including the Ballinhassig East GWB underlying the site. • The surface water drainage strategy integrates various measures, including attenuation ponds, rainwater harvesting, permeable paving and downstream defenders. These features will effectively manage surface water flows, directing them to an underground attenuation pond and infiltration tanks to maximize their storage potential. Flow control devices will be installed downstream of the pond outlet pipes to ensure that surface water runoff is stored efficiently before entering the receiving environment. • The proposed incorporation of hardstand areas and SuDS design measures may slightly reduce local groundwater recharge and increase runoff if not properly managed, potentially causing flooding and affecting downstream environments. However, the overall impact on the groundwater regime is expected to be insignificant due to the site's small area relative to the total aquifer, and construction will avoid areas with localized flooding to mitigate flood risks. To mitigate these risks, the design of the development and its drainage infrastructure will ensure that runoff rates are restricted to those of greenfield conditions. The development will incorporate SuDS and an underground attenuation system, with a design that up to and including the 100-year plus climate change allowance and discharge surface water to the downstream network at an appropriately determined rate. The proposed surface water management strategy aims to prevent surcharging during a 1 in 2-year storm events up to and including the 1 in 100 years plus allowance for climate change.
Biodiversity	The following mitigation measures will be implemented as part of the Proposed Development during the operational phase. ***Surface Water Protection*** Regular maintenance of surface water treatment facilities in accordance with best practice and manufacturers guidelines is required to keep the drainage system in adequate working order and to allow continued filtration of the surface water. ***Landscape Management*** Pollinators and foraging bats will be promoted through the management of the soft landscaping on-Site during the lifetime of the development, see landscape strategy prepared by SRLA (2025). ***Biodiversity Enhancement Measures*** **Swift Brick:** A project ecologist will be instructed to oversee the installation of the swift bricks or boxes, and calling system, during the construction phase or after the development has been completed, depending on which option is decided upon by the design team. **Bat Boxes:** Common bat species were observed foraging on the site during the bat surveys. The boxes will provide roosting opportunities for local bat populations and help to increase the availability of suitable roost features in the area. A total of 3-5 bat boxes is recommended to be installed within the central hedgerow spine in areas of low light and human disturbance. These boxes will be erected under supervision of the project ecologist and monitored for bat activity in the years post construction. **Amphibian and Reptile Hibernacula:** It is recommended to enhance the natural areas of the Site for amphibian and reptile use by providing suitable refuge and hibernacula **Bee Hotels:** Nesting boxes designed for solitary bees will be installed within suitable areas of the Site, near areas of flowering meadows or within the central hedgerow spine. **Wildflower Meadows:** The Landscape Plan includes the planting of wildflower meadows. It is recommended that wherever possible proposed wildflower areas are allowed to regenerate naturally by way of the existing seedbank within the soils present on Site. In addition, this can be supplemented by locally sourced wildflower seeds where necessary.

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Aspect	Mitigation
Noise & Vibration	A suite of noise and vibration control measures will be employed by the contractor during the operational phase. ***Building Services Noise*** With consideration at the detailed design stage, the selection and location of plant items within the proposed development and associated buildings will ensure that noise emissions from any mechanical and electrical building services plant do not exceed the relevant noise criteria within Section 12.4.4. ***Creche Noise*** As outlined within section 12.9.2.2 noise related to the proposed creche will result in a not significant effect. Notwithstanding this the operation of the creche will be limited to within the daytime hours and not cause noise nuisance that exceeds the internal noise criteria presented within Section 12.4.4. ***Inward Impact*** Mitigation against inward noise from the N40 road is listed by the way of enhanced glazing treatments at the specified facades
Air Quality	No site-specific mitigation measures are proposed for the operational phase as impacts are predicted to be not significant.
Climate	The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. These measures are outlined in Section 14.8.1 of Chapter 14 as incorporated design mitigation. No further operational phase mitigation is proposed.
Cultural Heritage	No archaeological, architectural or cultural heritage effects are predicted during the operational phase of the proposed development; therefore, no mitigation measures are proposed.

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