COAKLEY O'NEILL
town planning

# Environmental Impact Assessment Report (EIAR)

Strategic Housing Development at

Kilbarry on the Old Whitechurch Road, Cork City

## Volume II – Main Chapters

Prepared in June 2022 on behalf of

**CORK COUNTY GAA BOARD**

Coakley O'Neill Town Planning Ltd.

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# Document Control Sheet

| | |
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**KILBARRY SHD EIAR - VOLUME II**

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# 1.0 INTRODUCTION

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## Figures, Plates and Tables

## 1.1 Introduction

This chapter has been prepared by Coakley O'Neill Town Planning Ltd. The lead author is Dave Coakley, Director, Coakley O'Neill Town Planning Ltd, who graduated as a town planner from the University of West England in 2005, and holds the qualifications of BA (Hons), MPhil, MTCP, MIPI, and has worked in the public and private sector in Cork since 2001. Dave has over 20 years professional experience in the field of planning, which has included providing consultancy services in respect of several urban development, infrastructural development, and tourism development including EIA.

Cork County GAA Board seeks permission for a Strategic Housing Development (SHD) at lands on the Old Whitechurch Road, to the northeast of Cork City. The lands comprise open fields under grass, scrub, and gorse with established boundaries. An old hurling manufacturing factory lies derelict at the western side. The site is c. 15.52ha in area, and its location is generally shown in Figure 1.1 below.

The proposed Strategic Housing Development compromises 319no. residential dwellings, a crèche facility (519sqm) and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is 33,738.7sqm.

The subject lands have a number of sustainable development attributes that render them suitable for residential development in line with national, regional, and local policy. The lands are located within a strategic development area on the northside of the City. The lands are located within a development boundary and do not represent a new extension to a settlement. They are zoned. The proposed change amounts to a more appropriate use of existing zoned land.

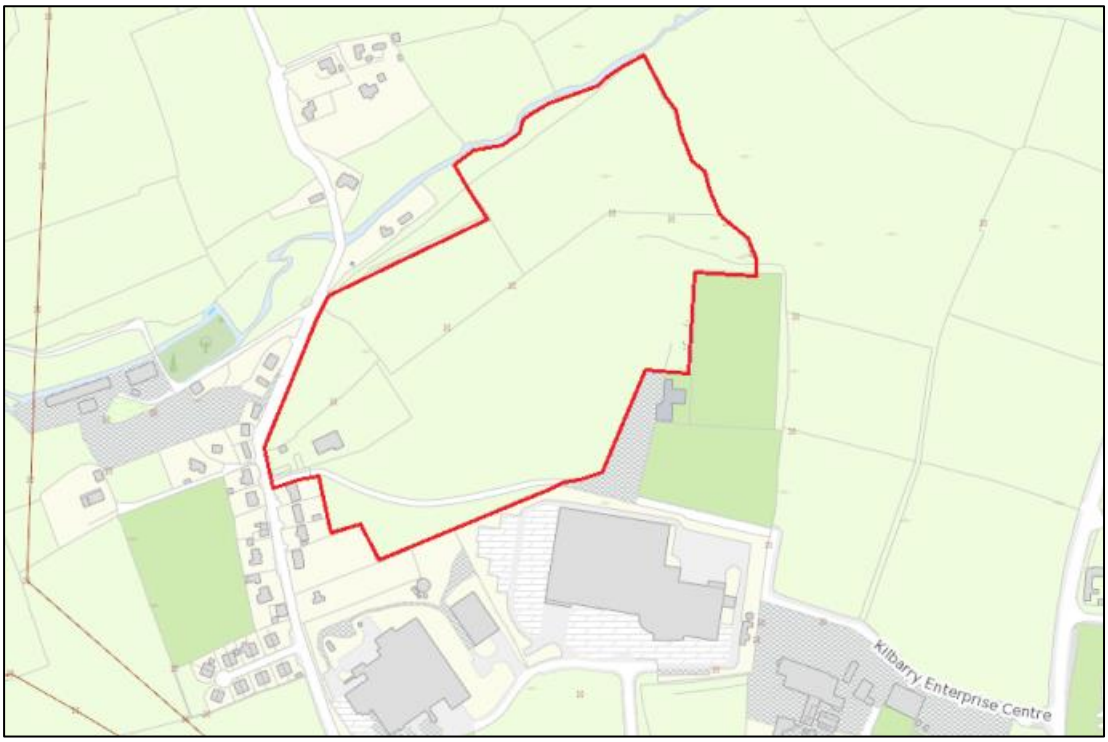


**Figure 1.1: Location of the proposed development (Site generally in Red)**

## 1.2 Overview of the Proposed Development

Cork County GAA Board intends to apply to An Bord Pleanála (the Board) for planning permission for this Strategic Housing Development (SHD) with a total application site area of c. 15.52 hectares. The proposed development will consist of the following:

- The construction of 319 no. residential dwellings comprising of 85no. semi-detached units (comprising of 17no. 4-bed units, 62no. 3-bed units and 6no. 2-bed units), 118no. terraced units (comprising of 8no. 4-bed units, 42no. 3-bed units and 68no. 2-bed units), 53no. duplex units (comprising of 26no. 1-bed units, 25no. 2-bed units and 2no. 3-bed units) and 63no. apartments (in 3no. part 4 storey and part 5-storey blocks and comprising 15no. 1-bed units and 48no. 2-bed units);
- The construction of a 519sqm crèche with ancillary outdoor play area;
- The total proposed gross floor area is 33,738.7sqm;
- The proposed development will also consist of:
    - the demolition of a disused hurley manufacturing factory and associated out buildings;
    - the removal and replacement of the southern and eastern boundary treatments;
    - the creation of formalised walking paths to replace the informal walking paths located to the north of the site;
    - a new through road from the proposed site access on the Old Whitechurch Road to Delaney's GAA Grounds and accessing the Upper Dublin Hill Road, with associated new boundary treatments at Delaney's GAA club;
    - all associated ancillary site development and hard and soft landscaping works, to include the provision of private, communal and public open space, waste storage areas, bicycle, motorcycle and car parking, including EV and disabled parking, ESB substations, groundworks, foul drainage works, stormwater drainage proposals including directional drilling for the stormwater outfall, water supply proposals, public lighting, and all new boundary treatments.

A detailed description of the proposed development is provided in Chapter 4 The Proposed Development.

## 1.3 Overview of the Planning Process

Under the provisions of the Planning and Development (Housing) and Residential Tenancies Act 2016, and the Planning and Development (Strategic Housing Development) Regulations 2017, planning applications for housing developments of more than 100 residential units and 200 plus student bed spaces can be made directly to An Bord Pleanála.

This type of application was introduced as part of the Department of Housing, Planning, Community and Local Government's "Rebuilding Ireland: Action Plan for Housing and Homelessness" (2016) to speed up the planning application process and accelerate delivery of larger housing and student accommodation proposals.

As the proposed development comprises 319no. residential units, a planning application will be made direct to An Bord Pleanála under the provisions of the Planning and Development (Housing) and Residential Tenancies Act 2016, and the Planning and Development (Strategic Housing Development) Regulations 2017.

The proposed development was subject to a Section 247 pre-application consultation meeting with Cork City Council on 8th September 2020.

A tripartite pre-application consultation meeting was held with representatives of An Bord Pleanála and Cork City Council on 4th March 2022 via a Microsoft Teams Meeting.

The Board issued its Opinion on 15th March 2022, which has determined that the materials submitted constitute a reasonable basis for an application.

This application is made on foot of the Board's Opinion of 15th March 2022.

### 1.4 Requirement for and Approach to Environmental Impact Assessment (EIA)

For the purposes of assessing the likelihood for development projects to have an impact on the environment, and the potential nature of those impacts, the European Union EIA Directive 85/337/EC, as amended by directives 97/11/EC, 2003/4/EC, 2011/92/EU and 2014/52/EU, has been transposed into Irish legislation in the form of Part X of the Planning and Development Act 2000, as amended (hereafter "the Act"), and Part 10 of the Planning and Development Regulations 2001, as amended (hereafter "the Regulations".

#### 1.4.1 Requirement for EIA

Section 172(1) of the Act sets out the requirement for EIA as follows:

> *An environmental impact assessment shall be carried out by the planning authority or the Board, as the case may be, in respect of an application for consent for proposed development where either—*
>
> *(a) the proposed development would be of a class specified in—*
>
> *(i) Part 1 of Schedule 5 of the Planning and Development Regulations 2001, and either—*
>
> *(I) such development would equal or exceed, as the case may be any relevant quantity, area or other limit specified in that Part, or*
>
> *(II) no quantity, area or other limit is specified in that Part in respect of the development concerned,*
>
> *or*
>
> *(ii) Part 2 of Schedule 5 of the Planning and Development Regulations 2001 and either—*
>
> *(I)such development would equal or exceed, as the case may be any relevant quantity, area or other limit specified in that Part, or*

*(II)no quantity, area or other limit is specified in that Part in respect of the development concerned,*

*or*

*(b)(i) the proposed development would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but does not equal or exceed, as the case may be, the relevant quantity, area or other limit specified in that Part, and*

*(ii) it is concluded, determined or decided, as the case may be,—*

*(I) by a planning authority, in exercise of the powers conferred on it by this Act or the Planning and Development Regulations 2001 (S.I. No. 600 of 2001),*

*(II) by the Board, in exercise of the powers conferred on it by this Act or those regulations,*

*(III) by a local authority in exercise of the powers conferred on it by regulation 120 of those regulations,*

*(IV) by a State authority, in exercise of the powers conferred on it by regulation 123A of those regulations,*

*(V) in accordance with section 13A of the Foreshore Act, by the appropriate Minister (within the meaning of that Act), or*

*(VI) by the Minister for Communications, Climate Action and Environment, in exercise of the powers conferred on him or her by section 8A of the Minerals Development Act 1940,*

*that the proposed development is likely to have a significant effect on the environment.*

Schedule 5 of the Regulations specifies the type and size of developments that require an Environmental Impact Assessment Report (EIAR) to be submitted as part of a planning application to the competent authority (An Bord Pleanála).

The proposed development at Old Whitechurch Road, Cork City is considered vis-à-vis the classes of development listed in Schedule 5 and those relevant to the nature of the proposed development.

Class 10, Part 2 of Schedule 5 of the Regulations lists the thresholds for infrastructure projects. Under Class 10 (b), applications for infrastructure projects require an EIAR to be submitted in the following instances:

*10(b)(i) 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 use.)*

In addition, Part 2 Class 14 of Schedule 5 of the Regulations lists the thresholds for demolition works. Under Class 14, applications for demolition works require an EIAR to be submitted in the following instances:

*Works of Demolition carried out in order to facilitate a project listed in Part 1 or Part 2 of this Schedule where such works would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.*

A preliminary EIAR was not submitted at pre-application stage in relation to the proposed development at Old Whitechurch Road, Cork City.

This is because, at 319 no. dwelling units, the proposed development does not come within the scope of the definition of infrastructure projects under Class 10(b)(i) of Part 2, Schedule 5 of the Regulations.

In addition, and in relation to demolition, the proposed development seeks permission for the demolition of an existing, disused hurley manufacturing facility (622m$^2$). Given the modest scale of the existing buildings, it is considered that the demolition works in and of themselves are not likely to have significant effects on the environment. For this reason, it is considered that mandatory EIAR under Class 14 of Part 2 of Schedule 5 of the Regulations is not required.

However, having reviewed the proposed development further and having regard to feedback received from the local planning authority and the Board during the pre-consultation stages of the preparation of the planning application for the proposed development, in light of the fact that the site of the proposed development measures c.15.52 hectares and is located within the existing built-up area of Cork city, it is considered that the proposed Strategic Housing Development requires the mandatory preparation of an EIAR, in accordance with Section 172(1)(b)(i) of Part X of the Act.

This is because the proposed development is considered to come within the scope of the definition of an infrastructure project as per Part 10(b)(iv) of Class 10, Part 2, Schedule 5 of the Regulations i.e. urban development which would involve an area greater than 10 hectares in a built-up area.

### 1.4.2 Definition of EIA

Section 171(A) of Part X of the Act defines EIA as being a process:

*(a) consisting of—*

*(i) the preparation of an environmental impact assessment report by the applicant in accordance with this Act and regulations made thereunder,*

*(ii) the carrying out of consultations in accordance with this Act and regulations made thereunder,*

*(iii) the examination by the planning authority or the Board, as the case may be, of—*

*(I) the information contained in the environmental impact assessment report,*

*(II) any supplementary information provided, where necessary, by the applicant in accordance with section 172(1D) and (1E), and*

*(III) any relevant information received through the consultations carried out pursuant to subparagraph (ii),*

*(iv) the reasoned conclusion by the planning authority or the Board, as the case may be, on the significant effects on the environment of the proposed development, taking into*

*account the results of the examination carried out pursuant to subparagraph (iii) and, where appropriate, its own supplementary examination, and*

*(v) the integration of the reasoned conclusion of the planning authority or the Board, as the case may be, into the decision on the proposed development, and*

*(b) which includes—*

*(i) an examination, analysis and evaluation, carried out by the planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that identifies, describes and assesses, in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following:*

*(I) population and human health;*

*(II) biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;*

*(III) land, soil, water, air and climate;*

*(IV) material assets, cultural heritage and the landscape;*

*(V) the interaction between the factors mentioned in clauses (I) to (IV), and*

*(ii) as regards the factors mentioned in subparagraph (i)(I) to (V), such examination, analysis and evaluation of the expected direct and indirect significant effects on the environment derived from the vulnerability of the proposed development to risks of major accidents or disasters, or both major accidents and disasters, that are relevant to that development;*

EIA supports the decision-making process as it is integrated into consenting processes for new development projects. This helps to ensure that consent decisions are made in the knowledge of the environmental consequences of the project.

Article 1(2)(g) of the 2014 EIA Directive (2014/52/EU) states that:

*"environmental 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."*

For the purposes of this EIAR, Cork County GAA Board is the "developer" of the proposed development and An Bord Pleanála is the "competent authority" responsible for undertaking the EIA and integrating its reasoned conclusion into the assessment of the proposed development.

### 1.4.3 Legislative Context

**Statutory Requirement for EIA**

A European Directive for EIA has been in force since 1985 since the adoption of Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment. The EIA Directive of 1985 has been amended three times by Council Directives 97/11/EC, 2003/35/EC and 2009/31/EC. It was ultimately codified and repealed by Council Directive 2011/92/EU on 13 December 2011. This Directive was further amended in 2014 by Council Directive 2014/52/EU which sets out the current requirements for member states on the assessment of the effects of certain public and private projects on the environment.

The EIA Directive requires the competent authority to consider and take account of the EIAR for certain public and private projects that are likely to have significant effects on the environment as part of the consent decision making process. In Ireland, the requirements for EIA in relation to planning consents are specified in Part X of the Planning and Development Act, 2000, as amended and in Part 10 of the Planning and Development Regulations, 2001, as amended.

As outlined above in Section 1.3.1, the proposed development requires an EIA under the provisions of the Planning and Development Act, 2000, as amended, and this EIA will be undertaken by the competent authority for the planning consent i.e., An Bord Pleanála.

This EIAR has adhered to the requirements of the EIA Directive and transposing European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018) which came into force on 1 September 2018, as well as associated guidance as described below in Section 1.4.4.

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 transpose into planning law the requirements of Directive 2014/52/EU, amending previous Directive 2011/92/EU, on the assessment of the effects of certain public and private projects on the environment (the EIA Directive) with effect from 1 September 2018. Where reference is made to the EIA Directive throughout this EIAR, it should be understood that the transposing European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 also apply.

Regard has also been had to the provisions of the Planning and Development Act 2000 (as amended), and the Planning and Development Regulations 2001 (as amended) as they apply now.

**Other Relevant Legislation**

*Habitats and Birds Directives*

EU member states are required to establish a network of Natura 2000 sites under the obligations of Council Directive 92/43/EEC (Habitats Directive) and Council Directive 79/409/EEC (Birds Directive), as amended and codified in Council Directive 2009/147/EC. The Natura 2000 network comprises designated sites selected to protect important biodiversity including rare and threatened habitats and species including:

- Special Areas of Conservation (SACs, including candidate SACs) protected under the provisions of the Habitats Directive; and
- Special Protection Areas (SPAs, including proposed SPAs) protected under the provisions of the Birds Directive.

The Habitats and Birds Directives require that the likely significant effects of any plan or project, alone, or in combination with, other plans or projects, on the Natura 2000 site network (i.e. European designated sites), should be assessed before any decision is made to allow that plan or project to proceed.

This process is known as Appropriate Assessment, which starts with Stage 1 AA Screening and, if likely significant effects cannot be ruled out, must progress to Stage 2 AA (i.e., preparation of a Natura Impact Statement). There are a number of steps and tests in place that should be undertaken sequentially and documented by competent authorities in order to make decisions on the approval or refusal of a plan or project that may impact on European designated sites.

Part XAB of the Planning & Development Act, 2000, as amended, which transposes the Birds and Habitats Directive requires the following to be undertaken:

- Stage 1 – Screening for Appropriate Assessment: To assess, in view of best scientific knowledge, if a development, individually or in combination with another plan or project is likely to have a significant effect on any European designated site.
- Stage 2 – Appropriate Assessment: This is required if it cannot be excluded, on the basis of objective information, that the development, individually or in combination with other plans or projects, is likely to have a significant effect on a European designated site. The appropriate assessment must include a final determination by the competent authority as to whether or not a proposed development would adversely affect the integrity of a European designated site. In order to reach a final determination, the consenting authority must undertake examination, analysis and evaluation, followed by findings, conclusions and a final determination. The appropriate assessment must contain complete, precise and definitive findings and conclusions, and may not have lacunae or gaps.
- Stage 3 – Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European designated sites.
- Stage 4 – An assessment where no alternative solutions exist and where adverse impacts remain: an assessment of compensatory measures where, in light of an assessment of

imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

A Stage 1 Appropriate Assessment (AA) Screening Report has been carried out to aid the Board in its determination as to whether or not a Stage 2 Appropriate Assessment is required. The AA Screening Report has been submitted as part of the planning application for the proposed development.

Based on the nature and extent of the proposed development and the conservation interests of the designated site, a Stage 2 Appropriate Assessment Natura Impact Statement (NIS) has been prepared for the proposed development and is also submitted as part of the planning application for the proposed development.

The NIS finds that, following an examination, analysis, and evaluation of the relevant information, including in particular the nature of the predicted effects from the proposed development and with the implementation of mitigation measures proposed that the construction and operation of the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion.

It is considered that further stages of AA are not necessary for the proposed development, however the competent authority, An Bord Pleanála, will make the final determination in this regard.

### 1.4.4 Guidance

In addition to the relevant legislation and regulations cited above in this report, in preparing this EIAR the following guidelines have also been considered:

- Environmental Protection Agency (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.
- Department of Housing, Planning and Local Government (2018). *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*.
- European Commission (2017). *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*.
- European Commission (2013). *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment*.

In addition, specialist disciplines have had regard to other relevant guidelines, and where relevant these are noted in individual chapters of the EIAR.

### 1.4.5 Structure of the EIAR

This EIAR is presented as follows:

- Volume 1 is a Non-Technical Summary,

- Volume 2 is the main EIAR report including introductory chapters in addition to 'assessment' chapters for each environmental aspect in accordance with Article IV of the EIA Directive. The front-end chapters (Chapters 1-6) provide the relevant project context whilst the assessment chapters (Chapters 7-18) provide a description of the relevant environmental aspects and likely significant effects with summary chapters provided thereafter (Chapter 19 and 20).
- Volume 3 contains the Appendices to the EIAR – these appendices provide the technical information which supports and is cross-referenced with the main EIAR. They include other relevant drawings, modelling outputs, background reports and/or supporting documents.

As is required by Annex IV of the 2014 EIA 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.

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 identified quality, significance and duration of effects for each aspect is, unless otherwise indicated, largely based on the terminology set out in EPA's *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022) as summarised in the table below.

| Impact Rating | |
|---|---|
| **Quality of Effects**<br>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral | **Positive Effects**<br>A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities). |
| | **Neutral Effects**<br>No effects of effects that are imperceptible, with normal bounds of variation or within the margin of forecasting error. |
| | **Negative/Adverse Effects**<br>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). |
| **Describing the Significance of Effects**<br>'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance). | **Imperceptible**<br>An effect capable of measurement but without significant consequences. |
| | **Not Significant**<br>An effect which causes notable changes in the character of the environment without but without significant consequences. |
| | **Slight Effects**<br>An effect which causes noticeable changes in the character of the environment without effecting its sensitivities. |
| | **Moderate Effects** |

| | |
|---|---|
| | An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. |
| | **Significant Effects**<br>An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment. |
| | **Very Significant**<br>An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment. |
| | **Profound Effects**<br>An effect which obliterates sensitive effects. |
| **Describing the Extent and Context of Effects**<br>Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced. | **Extent**<br>Describe the size of the area, the number of sites, and the proportion of the population affected by an effect. |
| | **Context**<br>Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?) |
| **Describing the Probability of Effects**<br>Descriptions of effects should establish how likely it is that the predicted effects will occur so that the CA can take a view of the balance of risk over advantage when making a decision. | **Likely Effects**<br>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented. |
| | **Unlikely Effects**<br>The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented. |
| **Describing the Duration and Frequency of Effects**<br>'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful. | **Momentary Effects**<br>Effects lasting from seconds to minutes. |
| | **Brief Effects**<br>Effects lasting less than a day. |
| | **Temporary Effects**<br>Effects lasting less than a year. |
| | **Short-term Effects**<br>Effects lasting one to seven years. |
| | **Medium-term Effects**<br>Effects lasting seven to fifteen years. |
| | **Long-term Effects**<br>Effects lasting fifteen to sixty years. |

| | |
|---|---|
| | **Permanent Effects**<br>Effects lasting over sixty years. |
| | **Reversible Effects**<br>Effects that can be undone, for example, through remediation or restoration |
| | **Frequency of Effects**<br>Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually). |
| **Describing the types of Effects** | **Indirect Effects (a.k.a. Secondary or Off-site Effects)**<br>Effects 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 Effects**<br>The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects. |
| | **"Do Nothing" Effects**<br>The environment as it would be in the future should the subject project not be carried out. |
| | **"Worst Case" Effects**<br>The effects arising from a project in the case where mitigation measures substantially fail. |
| | **Indeterminable Effects**<br>When the full consequences of a change in the environment cannot be described. |
| | **Irreversible Effects**<br>When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost. |
| | **Residual Effects**<br>The degree of environmental change that will occur after the proposed mitigation measures have taken effect. |
| | **Synergistic Effects**<br>Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog). |

**Table 1.1: Description of Effects (Source: EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022)).**

## 1.5 Design Team

The design has been developed on behalf of Cork County GAA Board by a multi-disciplinary design team including:

| Discipline | Company |
|---|---|
| Architecture | Doyle McDonagh Nash Landscape Architects |
| Landscape Design | Doyle McDonagh Nash Landscape Architects |
| Civil Engineering | JB Barry & Partners Consulting Engineers |
| Traffic and Transportation | MHL Consulting Engineers |
| Planning | Coakley O'Neill Town Planning Ltd. |
| Ecology | Doherty Environmental |

**Table 1.2: Design Team**

## 1.6 EIAR Team

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR, Cork County GAA Board engaged Coakley O'Neill Town Planning Ltd to direct and coordinate the preparation of the EIAR and a team of qualified specialists were engaged to prepare individual chapters, as set out in the table below. Details of competency, qualifications, and experience of the lead author of each discipline is outlined in the individual chapters.

| Chapter | Lead Consultant |
|---|---|
| **Non-Technical Summary** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 1 Introduction** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 2 Background and Need for Scheme** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 3 Alternatives Considered** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 4 The Proposed Development** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 5 Construction Strategy** | JB Barry & Partners Consulting Engineers |
| **Chapter 6 Planning and Policy** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 7 Traffic and Transportation** | MHL Consulting Engineers |
| **Chapter 8 Air Quality & Climate** | Axis Environmental Services |

| | |
|---|---|
| **Chapter 9 Noise & Vibration** | CLV Consulting |
| **Chapter 10 Biodiversity** | Doherty Environmental |
| **Chapter 11 Archaeology and Cultural Heritage** | John Cronin & Associates |
| **Chapter 12 Landscape and Visual** | Doyle McDonagh Nash Landscape Architects |
| **Chapter 13 Land, Soils, Geology and Hydrogeology** | JB Barry & Partners Consulting Engineers |
| **Chapter 14 Water** | JB Barry & Partners Consulting Engineers |
| **Chapter 15 Resource and Waste Management** | JB Barry & Partners Consulting Engineers |
| **Chapter 16 Material Assets** | JB Barry & Partners Consulting Engineers |
| **Chapter 17 Population & Human Health** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 18 Major Accidents and Disasters** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 19 Cumulative & Interactive Effects** | Coakley O'Neill Town Planning Ltd. |
| **Chapter 20 Summary of Mitigation Measures** | Coakley O'Neill Town Planning Ltd. |

**Table 1.3: EIAR Team**

## 1.7 Consultation Undertaken

### 1.7.1 Overview

Project-wide consultation has been undertaken with a range of stakeholders during the development of the EIAR and the SHD application.

Prescribed bodies as per Article 28 of the Planning and Development Regulations, 2001, as amended, were contacted to seek initial comments to inform the preparation of the EIAR.

Outline details of the proposed development were issued by email on 16th May 2022 to the Department of Housing, Local Government and Heritage, the Arts Council, Failte Ireland, the Minister for Tourism, Culture, Arts, Gaeltacht, Sport and Media (National Monuments and Nature Conservation), An Taisce, Inland Fisheries Ireland, Transport Infrastructure Ireland, the Heritage Council, the HSE, the Minister for Environment, Climate and Communications, and the Irish Aviation Authority.

Transport Infrastructure Ireland, the Department of Housing, Local Government and Heritage, Inland Fisheries Ireland, the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media, the Department of the Environment, Climate and Communications, Fáilte Ireland and the Irish Aviation Authority acknowledged receipt of the email correspondence of 16th May 2022.

Formal responses were received from the HSE, the Department of the Environment, Climate and Communications, Inland Fisheries Ireland, Transport Infrastructure Ireland, and the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media as set out in the following table. Copies of formal responses are attached at Appendix 1 of Volume III of this EIAR.

| Prescribed Body | Form of Correspondence | Content |
|---|---|---|
| HSE | Written correspondence sent by email (Catherine McCarthy, Principal Environmental Health Officer) 21st June August, 2022 | <u>Description of the Project:</u><br>The EIAR must fully describe the existing physical environment and detail any potential impacts on the existing environment both during the construction and operational phase of the project.<br>The design characteristics of the project and the reasons for proposing same should be outlined. It is recommended a diverse variety of household types is provided to offer people a range of lifestyle, affordability and life stage choices. The proposed residential development should incorporate the 'Universal Design' Principal to ensure the housing can meet the needs of the occupants regardless of their age, size, ability or disability.<br><br>It is also recommended that the development proposals are assessed to ensure compliance with the objectives of the Cork City Development Plan 2022 -2028.<br><br><u>Later Consents Required:</u><br>Information on any possible future monitoring requirements for the proposed strategic housing development should be included in the EIAR.<br><br><u>Consideration of Alternatives:</u><br>The EIAR should fully describe and consider any alternatives to this project. The applicant should outline a rational for the site selection and the proposed housing scheme design. |

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| | | Public Consultation:<br>The EIAR should describe measures the applicant took to inform the public about the project. Details of feedback from the public regarding the proposal should be included within the EIAR. Public consultation should be a two way process between the applicant and the public. The EIAR should clearly demonstrate how the legitimate concerns of the public have been assessed and evaluated and how the outcome of consultation with the public influenced decision making within the environmental impact assessment.<br><br>Construction<br>The construction phase of the development creates the potential for temporary emissions which may have a negative impact on the environment and on the health of local residents. The applicant should assess the impacts of construction works having particular regard to:<br>• Waste Management,<br>• Pest Control Management,<br>• Dust Impacts,<br>• Excessive Noise<br>• Emissions to Surface/Groundwater<br><br>All sensitive receptors in the vicinity of construction works should be identified and measures implement to ensure they are protected. It is noted that a Construction Management Plan is to be included in the EIAR. It is recommended that this plan identifies specific site constraints and includes mitigation measures specific to the complexities of the site in question.<br><br>Drainage<br>Any natural flood plains or wetlands on or in the vicinity of the site should be identified and measures implemented to ensure they are protected from the development. The impact of the proposed SHD on watercourses/wetlands further downstream should be assessed. |

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| | | An integrated approach to surface water management should be implemented on the site. It is recommended that green space and nature based solutions are provided for the storage and conveyance of rainwater on site and to improve flood mitigation in line with the principals outlined in the Greater Dublin Strategic Drainage Study (SUDS)1.<br><br><u>Climate</u><br>It is recommended the applicant ensures climate considerations are fully integrated into the planning of the strategic housing development and outlines how the proposed buildings contribute to climate action through their design. Specific measures which conserve energy consumption and reduce carbon emissions should be outlined in the EIAR.<br><br>The applicant should assess the vulnerability of the proposed development against the predicted impacts of a warming climate and they should predict and should outline proactive adaption measures to ensure the long term resilience of the site infrastructure to the impacts climate change.<br><br><u>Health Gain</u><br>The proposed strategic housing development should be explored for any opportunity to promote physical activity and any potential for health gain should be exploited. From the information obtained during a site visit it appears that there are some established walking trails on the site used by the public along with access points around the site for the public to gain access. It is recommended that the applicant submits proposals to incorporate these trails and/or to accommodate public walkers into the overall site design.<br><br>It is recommended that measures to promote walking and cycling throughout the development are implemented along with proposals to ensure the connectivity of the site with the wider urban area. Proposals for play facilities should be included with |

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| | | the application. Recreational facilities should also be provided to cater specifically for the needs of adolescents and the elderly.<br><br><u>Sustainable Transport</u><br>Evidence of the accessibility of the site and its proximity to amenities and services should be provided by the applicant. Any constraints regarding the site location shall be highlighted and explored. It is noted that the site is approximately a 25 minute walk to Blackpool Shopping Centre which may not be easily accessible by active travel for some of the public.<br><br>It is noted that the applicant proposes to assess the impact of traffic from the proposed development by carrying out a traffic and transport assessment. It is recommended that the applicant also outlines a travel plan for the proposed development which will facilitate and promote the use of public or active transport options for residents. Details from the site visit highlighted a public bus route along the main road adjoining the site that goes directly into the city centre. Further details of this service, including frequency and capacity should be provided.<br><br>The applicant should highlight the pedestrian and cycling facilities that connect the proposed strategic housing development to the town centre.<br><br><u>Landscape</u><br>Green recreational space is proven to have positive impacts on health, both physical and mental. 2 The recent global pandemic has highlighted the importance of access to open green space for recreational purposes for the public. The provision of quality, usable, urban green space is of paramount importance as housing design becomes more compact and the applicant should outline plans for private, semiprivate, and public space within the development. The proposal for a riverside amenity park are noted, further details of the layout, |

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| | | landscaping and maintenance of this park should be included in the EIAR.<br><br>The applicant should assess the impact the proposed strategic housing development will have on existing biodiversity in the area. The applicant should also assess the impact of any possible loss of recreational and amenity green area as a result of the proposed development.<br><br>It is recommended that green planting is integrated at all opportunities throughout the development to improve the quality of the built environment and the applicant should outline a diverse range of green spaces for the development in the EIAR. The applicant should also outline proposals to protect and promote biodiversity on the site.<br><br><u>Sustainable Development</u><br>The applicant should assess what significance the impact the increased population as a result of the proposed SHD will have on key infrastructure, educational and community facilities and amenities in the vicinity of the development.<br><br>The cumulative impacts of any other proposed housing developments in the vicinity should also be assessed. |
| Department of the Environment, Climate and Communications | Written correspondence sent by email (Clare Glanville Senior Geologist Geological Survey Ireland) 22nd June 2022 | (Summary of key points presented below):<br><br>• Geological Survey Ireland (GSI) would encourage use of and reference to GSI datasets.<br><br>• Our records show that there are no unaudited CGSs within the vicinity of the proposed development.<br><br>• The Groundwater Data Viewer indicates an aquifer classed as a 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones' underlies the proposed development. The |

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| | | Groundwater Vulnerability map indicates the area covered is 'Extreme Vulnerability' and 'Rock at or near surface'.<br><br>• Geohazards can cause widespread damage to landscapes, wildlife, human property and human life. In Ireland, landslides, flooding and coastal erosion are the most prevalent of these hazards. We recommend that geohazards be taken into consideration, especially when developing areas where these risks are prevalent, and we encourage the use of our data when doing so.<br><br>• The Landslide Susceptibility map indicates variable landslide susceptibility along the preferred route option, including areas of 'Moderately High' to 'High' susceptibility.<br><br>• We would recommend use of the Aggregate Potential Mapping viewer to identify areas of High to Very High source aggregate potential within the area.<br><br>• Should development go ahead, all other factors considered, Geological Survey Ireland would much appreciate a copy of reports detailing any site investigations carried out. The data would be added to Geological Survey Ireland's national database of site investigation boreholes, implemented to provide a better service to the civil engineering sector. |
| Inland Fisheries Ireland | Email Correspondence (Michael McPartland Senior Fisheries Environmental Officer) 25th May 2022 | It appears it is proposed to dispose of effluent from the development to the public sewer. IFI would ask that Irish Water signifies there is sufficient capacity in existence so that it does not a) overload either hydraulically or organically existing treatment facilities b) result in polluting matter entering waters or c) cause or contribute to non- compliance with existing legislative requirements.. Should this not be the case then please forward proposals for alternative treatment and disposal options. In relation to surface water the scheme should be |

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| | | designed so that it goes not result in increased flows in the Glennamought [sic] River.<br><br>IFI would ask that there be no interference with, bridging, draining, or culverting of any watercourse its banks or bankside vegetation to facilitate this development, without the prior approval of IFI. IFI note from the proposed drawings that the land immediately abutting the Glenamought River is proposed as parkland. IFI would ask that a 10m buffer zone be established from the river bank at all points and that inside of this buffer zone no construction activities or stockpiling of material occurs i.e natural vegetation should be undisturbed.<br><br>The issue of management and control of sediment (and other potential pollutants), particularly during the construction phase, to prevent their entry to waters during the construction phase also needs to be (sic.) addressed.<br><br>Indeed, under the Fisheries Acts it is an offence to<br>(a)injure or disturb any riverbed, bank or shallow where the spawn or fry of salmon, trout or eels maybe.<br>(b) empty, throw, cause or permit deleterious matter (which may include silt or other suspended solids) to enter waters.<br><br>IFI would ask that the impact assessment of the scheme ensures there can be no potential for a contravention of the Fisheries Acts as a result of the development. |
| Transport Infrastructure Ireland | Email Correspondence (Alban Mills, Senior Regulatory and Administration Executive) 16th May 2022 | |
| Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media | Email Correspondence (Customer Service, Department of Tourism, Culture, Arts, Gaeltacht, | Planning matters in general fall within the remit of the Department of Housing, Local Government and Heritage. Please note that following the coming into force of the Planning and Development, Heritage and Broadcasting (Amendment) Act 2021 (Act 11 of |

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| | Sport and Media) 16th May 2022 | 2021) all Heritage functions previously held by the Department of Culture, Heritage and the Gaeltacht are now held by that Department.<br>The Development Applications Unit may be contacted at Manager.DAU@housing.gov.ie (copied above).<br><br>Gaeltacht Areas<br>The Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media is a notice party under section 28(1) of the Planning and Development Regulations 2001 in relation to any planning application in a area where the proposed development could – in the view of the local Planning Authority – have a material impact on the linguistic and cultural heritage of the Gaeltacht, including the promotion of Irish as the community language. Such developments must be brought to the attention of the Department. |

**Table 1.4: Consultation responses from Prescribed Bodies**

In addition, and in order to establish the local need for a new crèche as part of the proposed development, contact was made with the Cork City Childcare Committee. The childcare assessment report included with this application has been prepared on foot of this consultation.

A dedicated website for the proposed development is established and the EIAR is available at: kilbarryshd.ie

Prior to lodging this application, the required information has been issued for the Department of Housing, Local Government and Heritage'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. The portal provides a URL link.

Where appropriate, Chapters 7 – 19 identify specific consultations that have been undertaken to support individual assessments and assessment chapters.

### 1.7.2 Consultation Feedback

The proposed development was subject to a S247 pre-application consultation meeting with Cork City Council on 8th September 2020 via Microsoft Teams. A copy of the minutes are attached at Appendix 1 of Volume III of this EIAR.

The key outcomes of this meeting, which have guided the preparation of this SHD application submission to An Bord Pleanála, are as follows:

(a) Primary concern is provision of North Distributor Road – flagged in recent Banduff SHD application (PL28.307373). Current status of the road proposal was set out and PA cautioned that proposal may be seen as premature pending Cork City Council's work on road.
(b) Stated proposed park is an important part of the application. PA provided confirmation that the approach being taken is generally acceptable.
(c) Works for park, in vicinity of watercourse, should be subject to AA consideration due to hydraulic link to Natura sites.
(d) Net versus Gross Developable Area will be determined by ABP but CCC's approach would be to use Residentially Zone Land as 'net developable area' for calculation of Density.
(e) Concern regarding the encroachment of apartment blocks into the NE-O-03 area and to a lesser extent of the use of land in NE-I-01 for ancillary aspects of residential development – open space and creche.
(f) Highlighted non-compliance with DMURS in particular as regards lengths of straight carriageways. Advised that DMURS should be incorporated into the layout.
(g) Praised layout with blocks of residences forming neighbourhoods. PA also requested that more thought be put into the delineation between public and private open spaces. This separation should be shown in more detail.
(h) Discussion regarding drainage to be offline. Requested SUDS consideration early in process.
(i) Some consideration of Flood Lighting from GAA pitch on residential amenity should be made.
(j) Application should include report demonstrating compliance with Cork County recreation and interim recreation policy.

A tripartite meeting was held with representatives of An Bord Pleanála and Cork City Council on 4th March 2022 via Microsoft Teams.

The Board issued its Opinion on 15th March 2022, a copy of which is attached at Appendix 1 of Volume III of this EIAR, which has determined that the materials submitted constitute a reasonable basis for an application.

The Board requires the following specific items to be addressed in the application:

1. *Further consideration of the status of the proposed development as a Strategic Housing Development, as defined in section 3 of the Planning and Development (Housing) and Residential Tenancies Act 2016, as amended, having regard to the zoning objectives set out in the Cobh Municipal District Local Area Plan, 2017 relating to these lands.*
   *In this regard a detailed statement of consistency and planning rationale should be provided, clearly outlining how, in the prospective applicant's opinion, the proposed development is in compliance with local zoning objectives having specific regard to the location of elements of this residential development within lands zoned Public Open Space (Objective NE-O-03), and the proposed distributor road and creche on lands zoned for Industry (Objective NE-I-01) in the Cobh Municipal District LAP.*
   *It should be noted that section 9(6)(b) of the Act provides that the Board shall not grant permission where the proposed development, or a part of it, contravenes materially the*

*development plan or Local Area Plan relating to the area concerned, in relation to the zoning of the land.*
*This may require amendment to the documents and/or design proposals submitted.*

2. *Further consideration of the documents, and if necessary, justification for the proposed development having regard to the Medium B Residential zoning objective relating to these lands. In this regard the statement of consistency and planning rationale should clearly outline how, in the prospective applicant's opinion, the proposed development is in compliance with this local zoning objective.*

3. *Further consideration of the documents, and if necessary, justification for the proposed development having regard to the relationship of the proposed development with, and potential impact on the selection of, the route for the proposed Cork Northern Distributor Road which is identified in the Cork Metropolitan Area Transport Strategy 2040 (CMATS), published by NTA in 2020, as a short-term objective and as a 'critical enabler' for the strategy.*

4. *Further consideration, and possible amendment to the documents in respect of the relationship of the proposed development with the Old Whitechurch Road. Consideration should be given to the design of the junction with the proposed distributor road demonstrating that adequate sightlines can be achieved at this location. In addition, the accommodation of pedestrian / cycle movements from the development and from the public park to the Old Whitechurch Road, and connections to the footpath network in the area should be fully considered. This may require amendment to the documents and / or design proposals submitted.*

5. *Further consideration of the documents with regard to the internal street layout and in particular the function and design of the of the proposed east-west distributor route. The application documentation should demonstrate how the proposed layout, building design and streetscapes assist in place making, wayfinding as well as creating a contemporary urban development with a variety of character areas. Regard should be had to the guidance provided in the Design Manual for Urban Roads and Streets (DMURS) in terms of the creation of sense of place, and section 2.2.1 in particular. The Urban Design Manual – a Best Practice Guide which accompanies the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009) provides further guidance in this regard, including in particular criteria number 2 Connections and number 7 Layout.*

*Furthermore, Pursuant to article 285(5)(b) of the Planning and Development (Strategic Housing Development) Regulations 2017, the prospective applicant is hereby notified that, in addition to the requirements as specified in articles 297 and 298 of the Planning and Development (Strategic Housing Development) Regulations 2017, the following specific information should be submitted with any application for permission:*

1. *A report addressing the matters raised in the report of the Urban Road and Street Design Section of Cork County Council. In addition, the application should be accompanied by the following:*

(a) *A Travel Plan / Mobility management plan, including details of connectivity and accessibility for future residents to Public Transport services.*
(b) *A Quality Audit in accordance with Advice Note 4 of DMURS, to include a detailed Road Safety Audit.*
(c) *A review of the location of the proposed childcare facility to the south of the proposed distributor route and its accessibility for residents of the proposed development.*

2. *In respect of soils and excavation:*

(a) *An assessment and statement of the potential for the presence of contaminated soils / materials on the site and a method statement for the resolution of these matters, where appropriate.*
(b) *An assessment of the extent of cut and fill required across the site and a method statement for any rock breaking activity.*

3. *Detailed section drawings through the lands describing the relationship between the proposed development and adjoining residential properties (existing and permitted) and with the Old Whitechurch Road, and the treatment of existing slopes across the site. Such drawings should clearly identify and illustrate the extent of cut and fill required to facilitate the development.*
4. *An assessment of the landscape and visual impacts of the development. Such assessment shall, inter alia, identify and assess impacts on views from the Old Whitechurch Road, west of the Bride River, and the impact on the landscape and visual character of works and tree removal along the roadside boundary.*

5. *A tree survey and Arboricultural Impact Assessment, having regard, inter alia, to proposed works along the boundary with Old Whitechurch Road.*

6. *The application should include a comprehensive daylight and sunlight assessment examining the proposed dwelling units and amenity / open spaces, as well as potential impacts on daylight and sunlight to adjoining properties. In preparing such assessment regard should be had to the provisions of section 3.2 of the Urban Development and Building Heights Guidelines for Planning Authorities (2018) and to the approach outlined in guides like the BRE 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'. The assessment should provide a comprehensive view of the performance of the entire development in respect of daylight provision. Where any alternative, compensatory design solutions in respect of daylight are proposed, these should be clearly identified and justified, and their effect appropriately described and / or quantified.*

7. *A phasing plan for the proposed development, which should include detail regarding the delivery of associated road and drainage infrastructure and public open spaces.*

8. *Site layout plans clearly identifying the areas intended to be taken in charge by the local authority. Specific proposals should be provided for the management of drainage / attenuation infrastructure associated with the proposed development located within the public park.*

9. *A response to the issues raised in the report of the planning authority in relation to Residential Amenity and House Design. Drawings clearly should clearly demonstrate that a satisfactory standard of private residential amenity space is provided for each unit, with particular regard to the quality of provision to corner units in duplex blocks.*

10. *A review of the relationship of the proposed development with the adjoining sports grounds and associated lands, in order to deliver high levels of residential amenity. Matters to be considered include the layout of housing units backing onto areas of open space and car parking and the potential for improved outlook for proposed dwellings.*

11. *A report that specifically addresses the proposed materials and finishes to the scheme, including specific detailing of external finishes, landscaping and paving, pathways, entrances and boundary treatments. Particular regard should be had to the requirement to provide high quality, durable and sustainable finishes which have regard to the context of the site.*

12. *A Building Lifecycle Report in accordance with section 6.13 of the Sustainable Urban Housing, Design Standards for New Apartments, Guidelines for Planning Authorities (2020) guidelines which should consider external materials on all elevations. The report shall also address the management and maintenance of public spaces and access routes to the development.*

13. *A statement as to how the proposed Strategic Housing Development has sought to comply with the principles of Universal Design (to encourage access and use of the development regardless of age, size, ability or disability).*

14. *The application should confirm that all screening assessments have taken account of the full scope of works required to facilitate the proposed development.*

15. *In accordance with section 5(5)(b) of the Act of 2016, as amended, any application made on foot of this opinion should be accompanied by a statement that in the prospective applicant's opinion the proposal is consistent with the relevant objectives of the development plan for the area. Such statement should have regard to the development plan or local area plan in place, or likely to be in place, at the date of the decision of the Board in respect of any application for permission under section 4 of the Act. The information referred to in article 299B(1)(b)(ii)(II) and article 299B(1)(c) of the Planning and Development Regulations 2001-2018 unless it is proposed to submit an EIAR at application stage.*

*Also, pursuant to article 285(5)(a) of the Planning and Development (Strategic Housing Development) Regulations 2017, the prospective applicant is informed that the following authorities should be notified in the event of the making of an application arising from this notification in accordance with section 8(1)(b) of the Planning and Development (Housing) and Residential Tenancies Act 2016, as amended:*

*1. National Transport Authority*
*2. Cork City Childcare Committee*
*3. Irish Water*
*4. An Taisce*
*5. Heritage Council*
*6. Minister for Housing, Local Government and Heritage*
*7. Inland Fisheries Ireland*

Cork City Council's Opinion issued on 8th December, 2021 and is attached at Appendix 1 of Volume III of this EIAR. The applicant's response to the Cork City Council's Opinion is included in the planning report which accompanies the planning application for the proposed development.

The applicant's response to the Board's Opinion of 5th March, 2022 is included with the planning application.

## 1.8 Difficulties Encountered during the Assessment

There were no significant difficulties encountered in the preparation of this EIAR.

## 1.9 References

Council Directive 79/409/EEC (Birds Directive)

Council Directive 92/43/EEC (Habitats Directive)

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

EIA Directive (2014/52/EU)

European Commission (2017) *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*.

European Commission (2013) *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.*

Environmental Protection Agency (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports.*

Planning and Development Act, 2000, as amended

Planning and Development Regulations, 2001, as amended

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## 2.0 BACKGROUND AND NEED FOR THE PROPOSED DEVELOPMENT

**Content**



**Figures, Plates and Tables**

## 2.1 Introduction

This chapter identifies the applicants and addresses the need for the proposed development.

## 2.2 The Applicant and Development Vision

The applicants are the Cork County GAA Board, the landowners of the subject site.

For Cork to credibly progress as a counterbalance to Dublin, the need for ambitious and quality residential developments such as this submission is now more significant than ever. In the regard, the applicants' vision for the proposed development site can be summarised as follows:

- To create a high quality residential development that supports the intensification of Cork City in a sustainable location within the city development boundary, served by public transport and facilities nearby.
- To utilise an adequately residential zoned site to provide much needed housing units in Cork City.
- To secure the high level of objectives promoting the growth of the northside to help spatially rebalance development in the city of Cork.

## 2.3 Proposed Development Site

The proposed development site is identified at zoned lands at the Old Whitechurch Road, Kilbarry, Cork.

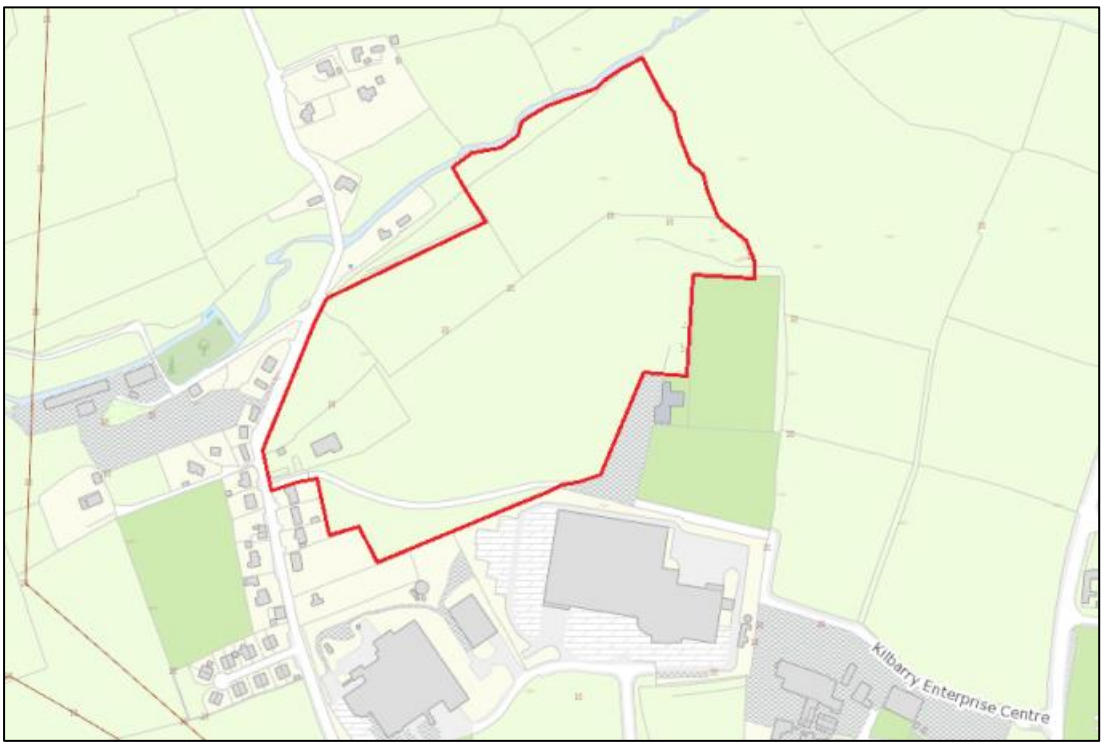


**Figure 2.1: Site Location (site generally outlined in red)**

The lands comprise open fields under grass, scrub, and gorse with established boundaries. An old hurling manufacturing factory lies derelict at the western side. The lands are bounded to their north by the Glenamought River and Valley. Here, the lands slope steeply down to the river and informal walking paths are evident. To the east, the lands are bounded by the Delaney's GAA grounds.

Along the southern boundary is a roadway running between the GAA club and the Old Whitechurch Road. Further to the south, and to the southeast beyond the GAA grounds, lie IDA employment lands within the Kilbarry Business and Technology Park. Cork City Council's Whitechurch LIHAF development lands are to the immediate southwest of the site.

## 2.4 Need for the Proposed Development

This section sets out the strategic context within which the proposed development is framed, having regard to national policy drivers, recent statistical information published by the Central Statistics Office (CSO), and recent commentary on housing supply and demand in Cork.

The planning rationale for the proposed development is set out in Chapter 6 of this EIAR.

### 2.4.1 Policy Drivers

**National Planning Framework (NPF) 2018**

- In terms of population growth, the NPF is entirely predicated on an estimated population increase of c. 1million people to 2040. Of that, National Policy Objective 1b estimates 340,000-380,000 additional people, i.e. a population of almost 2 million, in the Southern Region.

- In terms of housing these new populations, the NPF seeks to channel future growth in a sustainable manner targeting compact growth and 40% of Ireland's housing within existing urban settlements. National Policy Objective 3b seeks to deliver at least half (50%) of all new homes that are targeted in the five cities and suburbs of Dublin, Cork, Limerick, Galway, and Waterford, within their existing built-up footprints.

- In fact, having regard to Table 2.1 of the NPF, of the regional cities outside Dublin, Cork is expected to grow the most, by up to 125,000 people to 2040. The pattern of targeted population growth is presented in table 4.1 of the NPF as shown in Table 2.1 below:

| City | Population 2016 | Population Growth to 2040 | | Minimum Target Population 2040 |
|---|---|---|---|---|
| | | % Range | People | |
| Dublin - City and Suburbs | 1,173,000 | 20-25% | 235,000 - 293,000 | 1,408,000 |
| **Cork - City and Suburbs** | **209,000** | **50-60%** | **105,000 - 125,000** | **314,000** |
| Limerick - City and Suburbs | 94,000 | 50-60% | 47,000 - 56,000 | 141,000 |
| Galway - City and Suburbs | 80,000 | 50-60% | 40,000 - 48,000 | 120,000 |
| Waterford - City and Suburbs | 54,000 | 50-60% | 27,000 - 32,000 | 81,000 |

**Table 2.1: Table 4.1 of NPF: Targeted Pattern of City Population Growth**

- Specifically with respect to Cork, the NPF states that one of the key enablers for Cork is:

  ***Progressing the sustainable development of new greenfield areas for housing****, especially those on public transport corridors, such as Monard.* (**our emphasis)**

- **National Policy Objective (NPO) 1a** is aimed at ensuring that the projected level of population and employment growth in the Eastern and Midland Regional Assembly area (which contains the Greater Dublin Area) will be at least matched by that of the rest of the country. This national policy objective is informed by the concept of regional parity, where the targeted growth of the rest of the country should exceed that of the Eastern and Midland Region.

- **NPO 1b** states that the Southern Region of the country is to have an additional 340,000 - 380,000 people, i.e. a population of almost 2 million by 2040.

- In the context of Cork, **NPO 2a** translates to a target of half (50%) of future population and employment growth in Cork to be focused on Cork City and its suburbs.

- Similarly, **NPO 3b** reaffirms that at least half (50%) of all new homes to be developed in Cork City and its suburbs should be delivered within the built-up footprint of the city and its suburbs.

- Also in relation to Cork, the NPF sets a population growth target of at least 50-60% for Cork City and its suburbs by 2040. This is to facilitate Cork becoming a second city of scale. These population growth projections equate to at least 315,000 people living and working in the city and suburbs and will mean enabling the city to grow by twice as much to 2040 as it has over the past 25 years. Such a growth of population necessitates a significant amount of new housing to be developed.

- **NPO 32** is as follows:

  *To target the delivery of 550,000 additional households by 2040.*

- The new housing required for the target growth in population of Cork must be delivered in line with **National Strategic Outcome** 1 of the NPF – **Compact Growth**, which involves the developing of higher density schemes within the settlement boundaries of existing cities and towns that facilitate greater levels of sustainable travel and that are high-quality places that respond appropriately to their context.

- **NPO 72a** of the NPF requires Planning Authorities to set out a tiered approach to the zoning of land for development in their development plans. The NPF defines **Tier 1: Serviced Zoned Land** as follows:

  *This zoning comprises lands that are able to connect to existing development services, i.e. road and footpath access including public lighting, foul sewer drainage, surface water drainage and water supply, for which there is service capacity available, and can therefore accommodate new development.*

  *These lands will generally be positioned within the existing built-up footprint of a settlement or contiguous to existing developed lands. The location and geographical extent of such lands shall be determined by the planning authority at a settlement scale as an integral part of the plan-making process and shall include assessment of available development services.*

  *Inclusion in Tier 1 will generally require the lands to be within the footprint of or spatially sequential within the identified settlement.*

- In addition to the above, **NPO 11** is as follows:

  *In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and generate more jobs and activity within existing cities, towns, and villages, subject to development meeting appropriate planning standards and achieving targeted growth.*

The promotion and support of housing development within Cork City, and at the subject site, finds resonance with all of these existing national policy provisions.

**Housing Policy**

The Government's Construction 2020 strategy advised that, nationally, circa 25,000 housing units need to be built annually.

The latest Government housing plan, Housing for All, was published in September 2021 and addresses the time period to 2030, and identifies the need for an average of 33,000 new homes per year to 2030. The Plan notes:

*Right now, Ireland's housing system is not meeting the needs of enough of our people.*

- *There are not enough houses to buy or rent in the private sector.*
- *There are not enough houses being built by the State for those who need social housing.*

- *Housing has become increasingly unaffordable for the 'squeezed middle' who would once have expected to be able to purchase their own home.*
- *Too many people are experiencing homelessness or are unable to access appropriate housing.*
- *The cost of building housing is too high.*
- *Too much vacant housing stock remains unused.*
- *Our housing stock needs to be more environmentally friendly.*

To address this, the Plan sets out a vision to achieve a steady supply of housing in the right locations. It estimates that the country will need an average of 33,000 new homes each year between 2021 and 2030. The policy has four pathways to achieve this:

- supporting home ownership and increasing affordability
- eradicating homelessness, increasing social housing delivery, and supporting social inclusion
- increasing new housing supply
- addressing vacancy and efficient use of existing stock

In relation to pathway 3, the Plan states:

> *The State must act decisively to increase supply of both private and public housing. An average of 33,000 homes must be provided every year between now and 2030. Increased housing output is needed in all sectors - private, affordable, and social – to meet the needs of people in a wide variety of circumstances*

Despite growth in housing supply in recent years, the need for new housing in our cities remains critically urgent and is becoming even more pressing. In its June 2022 Quarterly Economic Bulletin, for instance, the Economic and Social Research Institute (ESRI) expects just 26,000 housing units to be completed in 2022 and 27,000 in 2023, falling short of the 33,000 per annum average target in the Government's Housing for All plan.

### 2.4.2 Population Growth and Targets

In the context of the policy provisions set out above, the need for additional housing in Cork City is illustrated by reference to published data from the CSO.

**Key National Statistics**

- The Preliminary Results for Census 2022 published on 24th June, 2022 show a population of 5,123,536 on Census night, 3rd April, 2022. This is an increase of 7.6% since 2016. It is also the highest population recorded in a census since 1841.

- The Preliminary Results also show that the total housing stock on 3rd April 2022 was 2,124,590, an increase of 6.0% on the 2016 figure. There were 16,560 fewer vacant dwellings (-9.0%) in 2022 compared to 2016. This does not include holiday homes, of which there were 66,135, compared with 62,148 in 2016.

- The CSO's most recent population and labour force projections for Ireland, published in June 2018 advise that Ireland's population is projected to reach 6.69 million in 2051, a rise of just under two million persons if there is high net inward migration and high fertility. Even with low net inward migration and declining fertility, Ireland's population is still expected to reach 5.58 million in 2051.

- The CSO publication reveals that there will be between 1.5 and 1.6 million persons aged 65 years and over by 2051, compared with 629,800 in 2016. Therefore, while around 13.3% of the population was aged 65 years and older in 2016, this will rise to up to 27.4% in 2051.

- Given this trend, it is clear that Ireland is now dependent on net in-migration to sustain population and employment growth.

**Cork City**

- Between Census 2011 and Census 2016, Cork City's population grew by 5.4%, making Cork the fastest growing population centre outside of Dublin.

- Cork City recorded relatively high net inward migration in the intercensal period 2011-2016, with net migration increasing by more than 7 persons per 1,000 of the population. According to Census 2016 there are a total of 195,900 households in Cork City and County, an increase of 4.2% since Census 2011.

- The Preliminary Results of the 2022 Census, recorded a 7.1% increase in population across Cork County. St. Marys Rural, the Electoral Division within which the subject site is located, recorded a population of 6,243. The population of the expanded Cork City boundary is 222,333 persons in 2022.

- The population of the new expanded City is set to grow to 345,000 by 2040 from 210,000 (2016). This translates to between 5,000 and 6,500 additional people living in the city, per annum out to 2040.

- An unintended consequence of this lack of supply is increasing house and rental prices. The average price of a new home in Cork City (€310,116 Geodirectory Residential Buildings Report , October 2021) is higher than the national average. Nationally, house price inflation is running at 12.3% (March 2022). It is clear that significant supply issues are driving prices up in the city with no large bulk of supply imminent in the short term. Whilst year on year unit completions are increasing, albeit off a low base, it is widely acknowledged that the lack of supply is continuing to create a dysfunctional residential market in the city.

- The situation is made all the starker in the context of the target of 50% of the population growth to 2040 to be in existing built up areas of Ireland's five cities, including Cork, as noted in section 2.4.1.1 above. This will require a significant increase in the number of dwellings across all house

types, allowing for greater density in the city and Metropolitan Area. In addition, a further 65,000 jobs have been targeted for the Cork Metropolitan Area by 2031, which will require an additional 27,300 housing units (of all types) to accommodate that growth.

- In addition to the demand for housing generated by the significant population growth targets for Cork City and its wider Metropolitan Area, as with the rest of the country, the population of Cork continues to experience a homelessness crisis. Latest figures from Focus Ireland reveal that Co. Cork has 423 adults in official homeless emergency accommodation and 7,172 households in total on the social housing waiting lists of Cork City Council and Cork County Council .

## 2.5 Conclusion

In conclusion, the need for the proposed development is premised on:

- National policy drivers which underline the requirement for a significant uplift in population in Ireland's urban centres, including Cork.
- The critical need for new housing supply within urban centres such as Cork to address the national housing crisis.

The need for new residential development in Cork City and the wider Cork Metropolitan Area is self-evident, as is the obligation to make the most efficient use of zoned land in the existing built-up area of Cork City.

The proposed development will also contribute towards the achievement of the target of an average of 33,000 homes per year set out in the Government's Housing for All plan.

## 2.6 References

National Planning Framework 2018
Regional Spatial and Economic Strategy for the Southern Region (RSES) 2020
Construction 2020 strategy
Housing for All 2021
ESRI Quarterly Economic Bulletin June, 2022
CSO Census 2016
CSO Preliminary Results Census 2022
Cork City Council Development Plan 2015-2021
Draft Cork City Development Plan, 2022
https://www.focusireland.ie/knowledge-hub/latest-figures/ [accessed 27th June 2022].

# 3.0 ALTERNATIVES CONSIDERED

**Content**



**Figures, Plates and Tables**

## 3.1 Introduction

This chapter has been prepared by Coakley O'Neill Town Planning Ltd. The lead author is Dave Coakley, Director, Coakley O'Neill Town Planning Ltd, who graduated as a town planner from the University of West England in 2005, and holds the qualifications of BA (Hons), MPhil, MTCP, MIPI, and has worked in the public and private sector in Cork since 2001. Dave has over 20 years professional experience in the field of planning, which has included providing consultancy services in respect of several urban development, infrastructural development, and tourism development including EIA.

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6 of the Planning and Development Regulations, 2001, as amended, which state:

> *"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."*

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

The Environmental Protection Agency (2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* state that:

> *"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."*

As such, the consideration and presentation of the reasonable alternatives studied by the project design team is an important requirement of the EIA process.

This chapter provides an outline of the main alternatives examined during the design phase. It sets out the main reasons for choosing the development as proposed, taking into account and providing a comparison on the environmental effects. For the purposes of the Regulations, alternatives may be described at five levels:

i. Alternative Locations
ii. Alternative Designs
iii. Alternative Processes

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'…"* The 2022 Guidelines are also instructive in stating: *"Analysis of high-level or sectoral strategic alternatives should not 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'"*.

## 3.2 Consideration of Alternatives

### 3.2.1 'Do Nothing' Alternative

A 'Do Nothing' scenario will perpetuate the current deficit in the supply of housing in Cork City.

In the context of the targeted growth in population for Cork to 2040 - by up to 125,000 people – a 'Do Nothing' alternative will not address the current deficit in housing supply in Cork City.

The lands are zoned for residential development. A Do-Nothing scenario would mean that these residential zoned lands would not be developed in accordance with the objectives of statutory planning policies and would be contrary to the City Council's objectives to promote residential land use at this site. This in turn would have the knock-on impact, creating pressure to develop unzoned, unserviced or remote sites.

In environmental terms, a 'Do Nothing' Alternative, which will see the current propensity for one-off rural housing, and with it, the increased significant adverse effects on population and human health, air and climate, transportation, and biodiversity, arising from further scattered population, increased vehicular traffic and journey times, to prevail.

A 'Do Nothing' alternative is, therefore, not a realistic alternative.

### 3.2.2 Alternative Locations

The Guidelines note that some projects may be "site specific" so the consideration of alternative sites may not be relevant or warranted.

The entire site, which is located in the built-up area of Cork City, is zoned for residential development under the new Cork City Development Plan 2022-2028, as was the case for the majority of the site in the previously applicable Cobh Municipal District Local Area Plan 2017.

At this location, the proposed scheme will deliver significant additional public and private housing in a range of house types in a consolidated and accessible urban neighbourhood in the existing built-up area of Cork City, which will be supported by ancillary community facilities and public open spaces. The site is well connected which will also ensure that the future residents will benefit from the existing shops and

facilities which are available in the area. This location also offers the potential for sustainable transportation modes.

As such, it is considered that the site is entirely suitable for the nature of the development as proposed in the application. The proposed development is fully aligned with the provisions of the National Planning Framework 2018 as outlined in Chapter 2 of this EIAR, which advocates compact urban housing growth and the intensification of population in the built-up area of Cork City.

There is the alternative option of developing more housing in the rural towns and villages outside Cork City. However, it is considered that rural villages and locations within and outside the Metropolitan Cork Greenbelt would not facilitate residential development proposals of scale to achieve the target population uplift for Cork City as envisaged in national policy. From an environmental perspective, there is potential for significant adverse impacts arising from water (lack of services) and transportation (lack of alternatives to the private car) in this alternative option. This option will also result in a less efficient use of land with lower densities (to meet market requirements for more family housing on relatively large plots), and there would be building height constraints.

In this context, the proposed development site is, therefore, the preferred location from an environmental perspective.

### 3.2.3 Alternative Designs

The design approach for the proposed development is presented in the Architectural Design Statement prepared by the project architects, DMNA Architects, which is included with the application. The proposed development has evolved during the design phase in response to input from the appointed EIAR team, advice received from Cork City Council at pre-planning stage and direction provided by An Bord Pleanála at the pre-application consultation stage of the Strategic Housing Development (SHD) process.

This process highlighted environmental matters that informed the consideration of alternative layouts and designs including private amenity space and communal amenity space, permeability and connections, height of the proposed development, impacts on visual amenity sunlight, daylight and overshadowing and transportation, up to the formalisation of the final scheme which is now being submitted to An Bord Pleanála for approval.

A number of site constraints and guiding principles influenced the site layout's design:

- The locations of existing residential developments, entrances, houses, and public open spaces.
- The locations of existing trees, hedgerows, watercourses, and water bodies.

The table below sets out the environmental considerations that were taken into account in progressing alternative designs for the proposed development.

| | |
|---|---|
| **Population and Human Health** | • Lower density layout options were discounted in accordance with national, regional and local planning policies relating to appropriate residential densities.<br>• Similarly, higher density layouts with a greater proportion of apartment blocks were discounted due the site location and the nature and character of housing development within the immediate area. An increased density combined with high car usage would have a significant negative effect on traffic congestion levels and greenhouse gas emissions. It would also contribute to increased levels of sedentary lifestyles.<br>• A number of alternative proposals for the apartment Blocks (5 storeys) were considered but were deemed to have a greater impact on the wider area in terms of the visual impacts experienced by the existing communities surrounding the site. |
| **Biodiversity** | • The positioning of the proposed apartment blocks was modified to account for the butterfly habitat to the northern side of the site.<br>• Alternative proposals for the route of surface water disposal were dismissed so as to avoid impacts upon this habitat. |
| **Land and Soils** | • The omission of housing from the zoned residential land to the western side of the site was considered appropriate due the topography of the area and the extent of cut and fill required. |
| **Water** | • None of the alternative layouts or designs had significantly different environmental effects to the proposed development insofar as impacts on groundwater or surface water are concerned |
| **Air and Climate** | • None of the alternative layouts or designs had significantly different environmental effects to the proposed development insofar as Air and Climate are concerned |
| **Noise and Vibration** | • None of the alternative layouts or designs had significantly different environmental effects to the proposed development insofar as Noise and Vibration are concerned |
| **Material Assets: Built Services** | • None of the alternative layouts or designs had significantly different effects to the proposed development insofar as Material Assets: Built Services are concerned. |
| **Material Assets: Transportation** | • The route of the proposed roadway through the site was considered but was deemed to have a great impact upon the residential amenity of residents. On this basis, a route along the southern boundary was favoured, creating a buffer between the residential areas and the adjoining industrial estate to the south.<br>• The layout options considered included alternatives for greater parking provision. Providing higher levels of parking without basements would have had the dual effect of reducing development density and increasing the level of private car traffic on the adjoining road network. These alternatives were therefore not favoured due to their effects on the road network and variance with the current policy |

| | |
|---|---|
| | objectives for promotion of public transport, pedestrian, and cycle modes. |
| **Material Assets: Resource and Waste Management** | • None of the alternative layouts or designs had significantly different environmental effects to the proposed development insofar as Resource and Waste Management is concerned. |
| **Cultural Heritage** | • None of the alternative layouts or designs had significantly different environmental effects to the proposed development insofar as Cultural Heritage is concerned. |
| **Landscape** | • A number of alternative proposals for the apartment blocks were considered but were deemed to have a greater impact on the wider area in terms of visual impacts. |

**Table 3.1 Synopsis of Comparison of the Environmental Effects of Alternatives Considered**

In addition, the Bord opinion advised the following in relative to the layout present at pre-application stage:

> *Further consideration of the documents with regard to the internal street layout and in particular the function and design of the of the proposed east-west distributor route. The application documentation should demonstrate how the proposed layout, building design and streetscapes assist in place making, wayfinding as well as creating a contemporary urban development with a variety of character areas.*
>
> *A review of the relationship of the proposed development with the adjoining sports grounds and associated lands, in order to deliver high levels of residential amenity. Matters to be considered include the layout of housing units backing onto areas of open space and car parking and the potential for improved outlook for proposed dwellings.*

The final alternative chosen improves upon the layout presented to An Bord Pleanála at the pre-planning consultation. This layout respects the nature of the existing site and its immediate context as much as possible, while also providing an appropriate residential density. This allows the national objectives of compact growth to be achieved while also protecting and enhancing existing biodiversity and ecology on site. It is considered that the chosen design as per this planning application and EIAR in general achieves a better result in terms of impact on the environment than the other design options considered.

In conclusion, the design of the proposed development has evolved over a number of iterations, responding to environmental considerations, and what is now presented in this application is the preferred development proposal, which will meet the applicant's vision.

### 3.2.4 Alternative Processes

This is not considered relevant to this EIAR having regard to the nature of the proposed development which contains over 100 residential units and as such, it is mandatory that the planning application is submitted to An Bord Pleanála as a Strategic Housing Development under the Planning and Development (Housing) and Residential Tenancies Act 2016.

### 3.3 Conclusion on Assessment of Alternatives

On the basis of the foregoing, 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 applicants, i.e., the project as now submitted for considered is deemed to be the most suitable project for the site.

### 3.4 References

Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6 of the Planning and Development Regulations, 2001, as amended

The Environmental Protection Agency (2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*

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## 4.0 THE PROPOSED DEVELOPMENT

**Content** **Page**



**Figures, Plates and Tables**

## 4.1 Introduction

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This chapter provides a detailed description of the proposed development. In accordance with Article 5(1)(a) of the 2011 Directive as amended by Directive 2014/52/EU the description of the proposal should comprise "*…information on the site, design, size, and other relevant features of the project*".

A description of the site and its surrounding is presented in Chapter 2. This chapter sets out a description of the proposed development. This description sets the basis against which the specialist assessments presented in this EIAR have been undertaken.

## 4.2 Site location and Context

The subject site is located to the northeast of Cork City Centre, and measures c. 15.52ha in area. The lands comprise open fields under grass, scrub, and gorse with established boundaries. An old hurling manufacturing factory lies derelict at the western side.

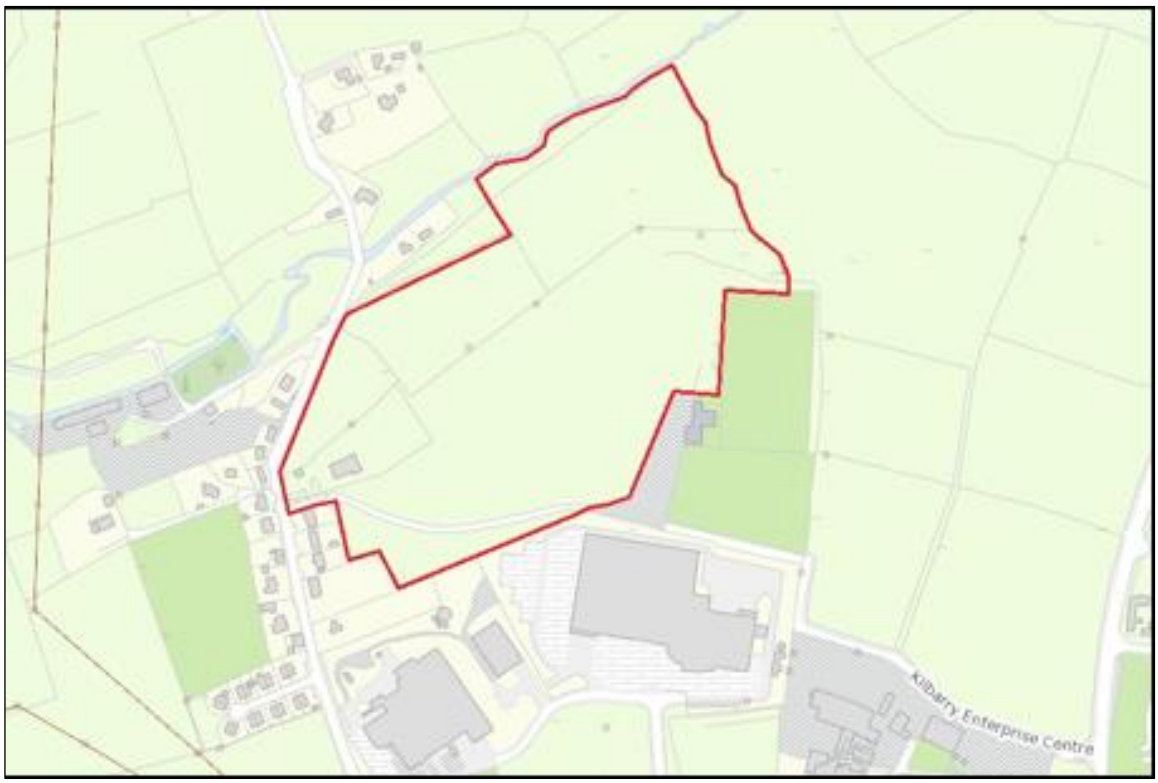


**Figure 4.1. Site Location (site generally outlined in red)**

The lands are bounded to their north by the Glenamought River and Valley. Here, the lands slope steeply down to the river and informal walking paths are evident. To the east, the lands are bounded by the Delaney's GAA grounds. Along the southern boundary is a roadway running between the GAA club and the Old Whitechurch Road.Further to the south, and to the southeast beyond the GAA grounds, lie IDA employment lands within the Kilbarry Business and Technology Park. Cork City Council's Whitechurch LIHAF development lands are to the immediate southwest of the site. Part 8 permission is in place on these lands to the immediate southwest for enabling / infrastructure works to facilitate their future development for approx. 600 no. housing units.


**Figure 4.2. Site Context**

**Plate 4.1. View of southern boundary of the site to City North Business Park looking west.**

## 4.3 Main Features of the Proposed Development

### 4.3.1 Proposed Development

The proposed development will consist of a strategic housing development of 319no. residential dwellings which will comprise 85no. two and three-storey semi-detached units (17no. 4-bed units and 68no. 3-bed units), 118no. two and three-storey terraced units (8no. 4-bed units, 60no. 3-bed units and 50no. 2-bed units), 53no. three-storey duplex units (26no. 1-bed units, 25no. 2-bed units and 2no. 3-bed units) and 63no. apartments in 3no. part 4 storey and part 5-storey blocks (15no. 1-bed units and 48no. 2-bed units). The development also includes the provision of a two-storey crèche facility (519sqm) and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is c. 33,738.70sqm.

The proposed development will also consist of the demolition of a disused single-storey hurley manufacturing factory and associated out buildings, the removal and replacement of the southern and eastern boundary treatments, as well the creation of formalised walking paths to replace the informal walking paths located to the north of the site, a new through road from the proposed site access on the Old Whitechurch Road to Delaney's GAA Grounds and accessing the Upper Dublin Hill Road, with associated new boundary treatments at Delaney's GAA club, all associated ancillary site development and hard and soft landscaping works, to include the provision of private, communal and public open space, waste storage areas, bicycle and car parking, including EV and disabled parking, 4no. ESB substations, groundworks, foul drainage works, stormwater drainage proposals including directional drilling for the stormwater outfall, water supply proposals, public lighting, and all new boundary treatments.


**Figure 4.3. Proposed Development (DMNA Architects)**

The construction of the proposed development will be completed in three phases, with the first phase of 109 units serviceable without the requirement for infrastructure upgrades outside of the site by Irish Water. The second and third phases of the development will include approximately 105 units in each phase, subject to final detailed agreement with the Local Authority and utility providers.

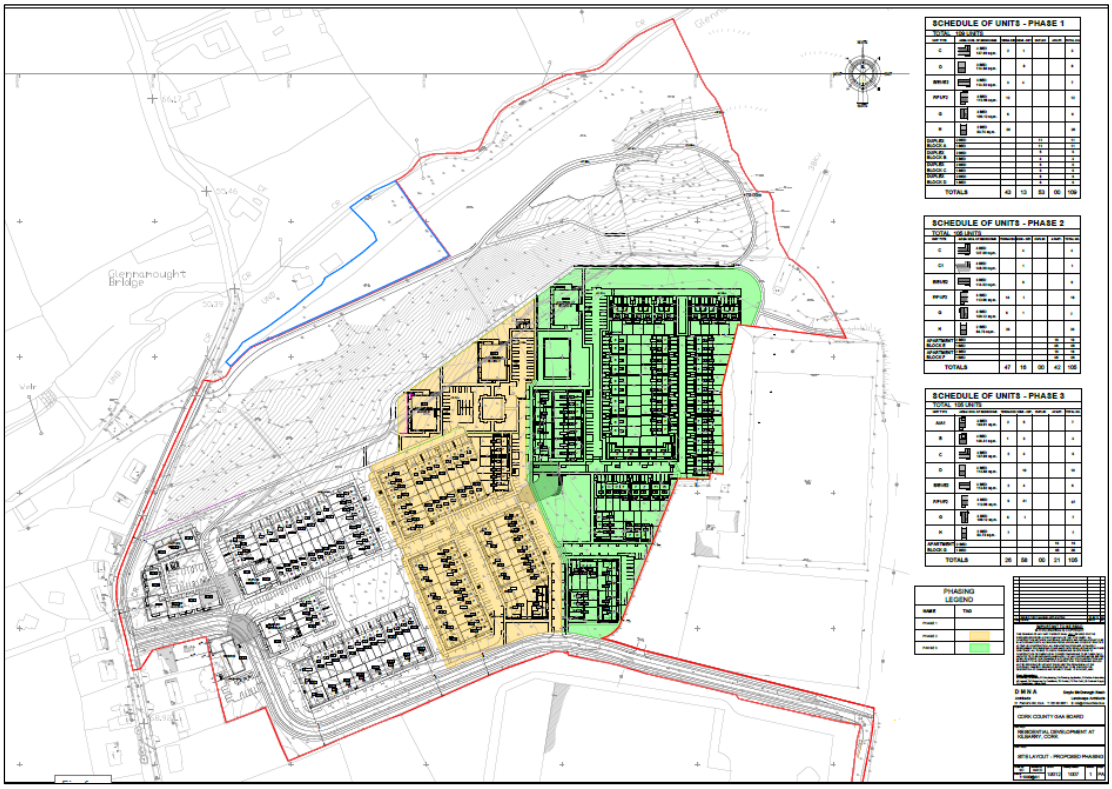


**Figure 4.4. Proposed Phasing Plan (DMNA Architects)**

### 4.3.2 Proposed Phasing

It is estimated that the proposed phases will take 36 months to complete, with approximately 12 months construction for each of three phases. A Construction and Environmental Management Plan prepared by JB Barry Consulting Engineers outlining the process is included with the planning application.

Proposed roads, houses, apartments and the creche will be developed as close to existing ground levels as is possible. However, given the relatively steep existing topography and the need to achieve reasonable longitudinal gradients along roads and Part M access into residential units and the creche, it will be necessary to excavate and fill across the site to achieve acceptable levels. The design of the development will balance the extent of cut and fill, in so far as practically achievable, to ensure that there is not a significant surplus or deficit of material required.

Prior to any Phase 1 construction works being carried out, the proposed development will initially involve some site clearance, the demolition of existing, disused commercial buildings and stone houses structures and earthworks in order to clear and grade the site to accommodate the construction of all associated engineering works and subsequently the building foundations.

Development will commence at the western side of the site adjoining the Old Whitechurch and move across to the site's eastern side and the boundary with Delaney's GAA Club.

**Phase 1**

Phase 1 of the proposed development is to comprise the construction of 109no. residential units at the western side of the site, adjoining the Old Whitechurch Road. These units are the comprise:

- 3no. Type C 4-bed dwellings, each 137.69sqm in area
- 8no. Type D 3-bed dwellings, each 114.68sqm in area
- 7no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area
- 12no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area
- 6 no. Type G 3-bed dwellings, each 109.12sqm in area
- 20no. Type H 2-bed dwellings, each 83.73sqm in area
- 4no. duplex blocks comprising
    - Block A: 11no. 1-bed units and 11no. 2-bed units
    - Block B: 4no. 1-bed units and 5no. 2-bed units
    - Block C: 5no. 1-bed units and 5no. 2-bed units
    - Block D: 6no. 1-bed units and 6no. 2-bed units

The phase will include the construction of the east-west distributor roadway along the site's southern boundary. This phase will also see the construction of the community creche and associated parking adjacent the roadway.

This phase also incorporates the development of a public park in the area of the Glennamought River along the northern side of the site, which will form part of a wider parkland area along the river corridor once adjoining areas are developed. While the park terrain here is too severe to accommodate active play in terms of games, it is proposed to provide walking and bicycle routes in excess of 2kms. Mown turf open space areas for passive recreation are provided where the slope condition is least severe and where more severely sloped, it is proposed to accommodate a range of woodland and open meadows with long and short grass management interspersed with specimen tree planting to keep the landscape open to view.

**Phase 2**

Phase 2 comprises the central area of the site and is to comprise the construction of 105no. residential units. These units are the comprise:

- 4no. Type C 4-bed dwellings, each 137.69sqm in area
- 1no. Type C1 4-bed dwelling, 149.50sqm in area
- 9no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area
- 19no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area
- 7 no. Type G 3-bed dwellings, each 109.12sqm in area
- 23no. Type H 2-bed dwellings, each 83.73sqm in area
- 2no. apartment blocks comprising
    - Block E: 5no. 1-bed units and 16no. 2-bed units
    - Block F: 5no. 1-bed units and 16no. 2-bed units

**Phase 3**

Phase 3 comprises the eastern area of the site and is to comprise the construction of 105no. residential units. These units are the comprise:

- 7no. A/A1 4-bed dwellings, each 146.91sqm in area
- 4no. Type B 4-bed dwellings, each 146.31sqm in area
- 6no. Type C 4-bed dwellings, each 137.69sqm in area
- 10no. Type D 3-bed dwellings, each 114.68sqm in area
- 6no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area
- 37no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area
- 7 no. Type G 3-bed dwellings, each 109.12sqm in area
- 7no. Type H 2-bed dwellings, each 83.73sqm in area
- 1no. apartment block comprising
    - Block G: 5no. 1-bed units and 16no. 2-bed units


**Plate 4.2. Proposed Development Photomontage View**


**Plate 4.3. Proposed Development Photomontage View**


**Plate 4.4. Proposed Development Photomontage View**

### 4.3.3 Key Development Statistics

A detailed floorspace schedule is set out in the Housing Quality Assessment prepared by DMNA Architects and submitted with the planning application. The principal development statistics are as follows:

| Development Statistic | Proposed Development |
|---|---|
| **Site Area** | 15.52ha |
| **Gross Demolition Area** | 695sqm |
| **No. Residential Units** | 319 No. residential units, to include:<br>• 85 no. semi detached<br>• 118 no. terraced<br>• 53 no. duplex units<br>• 63 no. apartments |
| **Gross Floor Area** | 33,738.70m$^2$ to include:<br>• 33,199.70m$^2$ residential<br>• 539m$^2$ creche and substations |
| **Building Height** | House Types A/A1/B – 3 Storeys<br>House Types C/C1/D/E/E1/E2/F/F1/F2/G/H/J – 2 Storeys<br>Duplex Blocks A/B/C/D – 3 Storeys<br>Apartment Blocks E/F/G – 5 Storeys<br>Creche – 2 Storeys |
| **Resident Support Facilities** | Creche – 519 m$^2$ |
| **Resident External Amenity Space** | Total Open Space Provision on overall lands – 7.051ha (45%)<br>Total Active Open Space on overall lands – 2.777ha (18%)<br>Active Open Space within developable area 1.22ha (14%) |
| **Part V** | 64no. units, as follows:<br>• 8no. Type F/FI/F2 Terrace Units<br>• 2no. Type F/FI/F2 Semi-Detached Units<br>• 2no. Type G Terrace Units<br>• 10no. Type H Terrace Units<br>• 32no. 2-bed Apartments<br>• 10no. 1-bed Apartments |
| **Plot Ratio** | 0.41 |
| **Site Coverage** | 17% |
| **Residential Density** | 38.77 units/ha on developable area |
| **Aspect** | 100% of Duplex Units benefit from dual aspect<br>81% of apartments benefit from dual aspect |
| **Cycle Spaces** | 124no. cycle spaces |
| **Motorbike Spaces** | 12no. parking spaces |
| **Car Spaces** | 534no. parking spaces |
| **Substations (4no.)** | 20m$^2$ (in total) |

**Table 4.1. Key Development Statistics**

### 4.3.4 Design Approach

As detailed in Chapter 2 of this EIAR, the proposed development will consist of a Strategic Housing Development of 319no. residential dwellings which will comprise 85no. two and three-storey semi-detached units (17no. 4-bed units and 68no. 3-bed units), 118no. two and three-storey terraced units (8no. 4-bed units, 60no. 3-bed units and 50no. 2-bed units), 53no. three-storey duplex units (26no. 1-bed units, 25no. 2-bed units and 2no. 3-bed units) and 63no. apartments in 3no. part 4 storey and part 5-storey blocks (15no. 1-bed units and 48no. 2-bed units). The development also includes the provision of a two-storey crèche facility (519sqm) and a riverside amenity park to the north and northeast of the site.

The Architectural Design Statement prepared by DMNA Architects that accompanies this planning application sets out the design rationale in detail.

The following design objectives have informed the design process of the proposed scheme

- Creation of a high-quality living environment for residents and enhancement of the social, environmental, and visual quality of the area;
- Design of the layout to discourage anti-social behaviour, particularly by ensuring that the development overlook all access, parking, and public open areas;
- Promoting the concepts of enclosure, the clear separation of public/ private realm and permeability as the means to achieve a high-quality residential environment; and
- Maximise amenity and energy efficiency through climate sensitive design that takes account of orientation and typography, and the retention of existing site features of merit.

The overall approach to the design of the proposed development is as follows:

- The design layout responds to the site's topographical context, and to on-site constraints and potentials.
- The development proposes a new access from the Old Whitechurch Road north of the existing houses bounding the site. This distributor road is then proposed along the southern boundary of the site to link through towards the Delaney's GAA club lands to the east and along with the landscaped edge to the south of it creates a buffer between the existing industrial estate and the proposed housing development.
- Throughout the scheme, appropriate responses are made to the nature of specific boundary conditions. The development is designed with housing generally backing onto the existing boundary with the Delaney's GAA club lands, but to then look out over the existing open space zoned lands to the north and towards the distributor road to the south of the site. The open space zoned lands are proposed as a new public park, with significant pedestrian and cycleways to link to both the east and west to create a large riverside amenity.
- To ensure overlooking of this space and to a strong urban edge, 3no. apartment buildings are proposed along the boundary of the residential areas and the public park. These apartments step down a full level, in order to address the level change along this interface and to create a linear usable open space area immediately adjacent to the residential development within the public park.

- The design's overall form, architecture & landscaping respond suitably to the location creating a sense of place and the development positively contributes to the character and identity of the neighbourhood.
- The site is located within an existing urban environment on the northern fringe of Cork City. A number of new connections are proposed from the site to neighbouring facilities and infrastructure. A new distributor road with footpath and cycleway facilities is proposed along the southern section of the site linking the old Whitechurch Road to the Delaney's GAA lands to the east. In addition to this cycleway heading west to east, two other cycleways are included heading north south through the development. The first links the public plaza adjacent to the creche to the public park along the northern fringe of the site. The second cycle route links from the distributor road at its eastern end within the site through the scheme linking the second plaza space with the various recreation facilities included within the development such as the playground, kick about area, and the external gym and finally onto the cycle routes within the public park. These route and the development's layout with cycleways and pedestrian connections from it into the development will also make it easy for a bus to serve the scheme.
- Within the scheme there is a range of public, communal and private amenity spaces and facilities for children of different ages, parents and the elderly. This ranges from the large public park with amenity walks, to a number of usable open space areas within the development which are designed for informal play to the recreation facilities located along the pedestrian and cycleway which runs north south through the development linking the distributor road to the public park through the development. These facilities include a public plaza designed to be suitable to external performances to a playground area for younger children, a kick about area for older children and an outdoor gym for adults and older people. Areas defined as public open space will also be clearly defined, accessible and open to all.
- The houses, apartments and duplex units are designed and arranged on site to maximise solar gain. Houses are arranged to minimise the number of north facing rear gardens, and specific wide fronted house types have been designed so that all the main habitable rooms facing south maximise solar gain.
- Landscaped areas are designed to provide amenity and biodiversity. A range of amenity areas are provided which vary from the large public park to smaller pocket parks within the development. A biodiversity area is proposed to the northern section of the public park along the Glenamought river which will not be accessible to the public. The scheme will also incorporate sustainable urban drainage systems.
- The layout makes the most of the opportunities presented by the existing sloped ground of the river valley in the northern portion of the site through the creation of a new public park which is overlooked by the development and interconnected with it. In this regard the proposed apartment buildings are crucial, providing an urban edge, whilst also ensuring overlooking of a significant portion of the open space and also successfully exploiting views out of the site to the north and west.
- In accordance with the Design Manual for Urban Streets and Roads, the design has a clear hierarchy of roads within the scheme. From the proposed distributor road to the south to the two linked local access roads within the scheme down to minor access roads and finally shared surfaces and homezones a clear hierarchy is designed throughout the scheme. Road widths, turning radii, surface finishes and detailing will differentiate each road type. Furthermore,

dedicated pedestrian and cycling facilities are provided throughout the scheme linking each part of the development and also linking the development to neighbouring sites and facilities.

- The streets are designed as places instead of roads for cars, helping to create a hierarchy of space with less busy routes having surfaces shared by pedestrians, cyclists and drivers, with traffic speeds controlled by design and layout rather than by speed humps.
- All public open space is overlooked by surrounding homes so that this amenity is owned by the residents and safe to use. A number of pocket parks are located throughout the development, and these are designed so that they are overlooked by the adjacent houses. In this case shown below the roads around the open space are pedestrian priority share spaces which ensures that the open space can be accessed safely from the houses surrounding it.
- The public realm is considered as a usable integrated element in the design of the development. For example, in the public plaza space shown below is located along the north-south combined pedestrian and cycle route which traverses the site connecting the distributor road to the public park. The plaza incorporates the road adjacent to make it a pedestrian friendly space while also assisting in reducing traffic speeds at a key junction in the overall development.
- The layout has been designed with car parking generally on-street or within easy reach of the home's front door. In all situations, parked cars are overlooked by houses, pedestrians and traffic. In excess of 75% of units are provided with communal parking on the basis of 1 space per apartment and duplex unit, 1.5 spaces per 2 bed house and 2 spaces per house for houses of 3 and 4 bedrooms. This will ensure that the efficiency of parking spaces is maximised and allow for the accommodation of visitors without the need to provide additional dedicated spaces. Materials used for parking areas are of similar quality to the rest of the development and communal spaces are designed with significant landscaping to reduce the visual impact of parked cars on the development.
- Adequate secure facilities are also provided for bicycle storage, with all duplex units having shared covered bicycle parking areas provide either in open space areas of in communal semi-public courtyards to the rear of the units. All apartments have an internal bike storage area incorporated into the basement level where there are steps in level. Communal motorbike parking is provided within shared parking areas to all duplexes and apartments in accordance with the Cork City Development Plan.
- Bin stores for the terraced houses have been designed within the public areas to be close to the houses they serve and small in nature so that they can be accommodated within landscaped areas and adequately screened. Bin stores for the apartments are incorporated internally into the basement floor level, where there are steps in section. For the duplex units, bin stores are generally either located on the property where possible through the creation of small private amenity areas at ground level. Where bin stores are shared, they are located in sheltered areas within larger landscape public spaces such as between blocks A and B, or in the rear semi private courtyard of blocks C and D.

### 4.3.5 Services

In relation to services, the following is proposed:

- Following a Pre-Connection Enquiry, Irish Water (IW) issued a Confirmation of Feasibility (COF) stating that the site can be serviced by its wastewater infrastructure network. The proposed designs were progressed in accordance with Irish Water's Code of Practice for Wastewater Infrastructure and were submitted to Irish Water for review and consideration for design acceptance as per the requirement of the SHD process. A Statement of Design Acceptance was issued by Irish Water.

- Foul Water Services: Following a Pre-Connection Enquiry, Irish Water (IW) issued a Confirmation of Feasibility (COF) stating that the site can be serviced by its wastewater infrastructure network. This COF is included in the Appendices. The COF states that a connection to the existing 225mm foul sewer in the Whitechurch Road can be made to serve the first 100 houses of this proposed development. In order to facilitate the connection of the remaining proposed units, approximately 150m of upgrades are required to the existing Whitechurch Road foul sewer and it is likely that further sewer network upgrades will be required downstream. Irish Water currently have a project underway to assess the necessary upgrades to the existing foul sewer network, which in due time will inform the required upsizing of the Whitechurch sewer.

- Water Services: Irish Water water distribution records show that there is an existing 150mmØ ductile iron watermain located in the Whitechurch Road, west of the site. The COF confirms that a connection to the existing 150mm ductile iron watermain in the Whitechurch Road can be made to serve the first 100 houses of this proposed development. In order to facilitate the connection of the remaining units, approximately 750mm of upgrades are required to the existing Whitechurch Road watermain. These upgrades include upgrading the existing 150mm watermain to 250mm as far as the existing 300mm watermain in the Killarney Business Park.

  IW have been consulted with in order to agree a high-level solution to the necessary upgrade works. IW have confirmed that the upgrade works can be carried out on public roads and do not involve provision of infrastructure that would require planning approval. This upgrade work can be carried out by the developer at his own cost or by Irish Water with levies applied at Connection Application stage to cover the cost of these works. Agreement on the optimum procurement methods for the provision of this infrastructure can be a matter for later detailed agreement with Irish Water.

  To serve the development's 319 units, a short length of 200mmØ watermain is required for the initial connection. The remainder of the development will be served by 150mmØ and 100mmØ diameter watermains.

- Surface Water: The proposed surface water network will include a storm drainage pipe network, attenuation storage structures and several SuDS features which will aid the reduction of runoff volumes by slowing surface water flows, providing the opportunity for evapotranspiration and

providing the opportunity for infiltration to ground. Both the interception and attenuation storage requirements of GDSDS will be sufficiently met.

An assessment of the potential SuDS measures that could be incorporated within the site was conducted using the SuDS Manual, CIRIA 753 as guidance. The following SuDS features have been identified as applicable and will be provided within the proposed scheme:

- Green Roof: a green roof will be provided on the creche building. The roof will be an extensive type with sedum planting at the surface with a drainage layer beneath. The drainage layer will convey flows to discharge locations. It is not proposed to restrict the discharges from the roofs.
- Permeable Paving: will be provided for all parking spaces. Permeable paving will be a Type B as per SuDS Manual, CIRIA 753, a combination of infiltration and piped drainage.
- Tree Pits/Bioretention Planters: will be provided in every feasible location where there is a proposed tree or planter. The tree pits will contain engineered soil filled tree boxes with drainage pipes beneath to link trees together and tie in with the proposed surface water sewer. The bioretention planters will consist of a shallow landscaped depression at the surface with a drainage layer beneath.
- StormTech Attenuation Tank: will be provided at the natural low points for final storage of runoff volumes before discharging to the existing river at a controlled rate.

Attenuation will be provided by StormTech attenuation chambers which will cater for the 100-year storm event with a 10% climate change allowance added. The surface water network has been split into two catchments, A and B. The outflow from Catchment A will tie in with the Catchment B network. The final storage location, Catchment B, is located in the undeveloped northern area. The route from the final storage area to the final discharge location at the River Bride must pass a protected butterfly habitat and navigate a steep decline to the river edge. To combat these issues, it is proposed to utilise directional drilling along the outfall route beneath the butterfly habitat at a depth of approximately 3.4m – 4.2m below existing ground. The underground drilling will be continued beyond the habitat area, as far as the transition from underground to open channel at manhole S77. From this point it is proposed, due to steepness of the gradient to the discharge location, to create a meandering open drain with check dams. The open drain will be designed in consultation with the landscape architect and ecologists to ensure that the open drain is considerate of the existing landscape and will ensure that flows are managed, and erosion of the open drain does not occur. It is proposed to discharge surface water from the final storage area at a maximum rate of Qbar (26.26 l/s).

In relation to electricity, 4no. new substations will be installed as part of the development. This will have enough capacity for the proposed development, including the proposed EV charging points. A connection will be made to the existing network where there is sufficient capacity for the proposed development. In relation to telecommunications and broadband, the developer is required to place an order with a telecoms provider for new fixed phone lines and fixed broadband connections.

## 4.4 References

There are no references.

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## 5.0 Construction Strategy

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**Figures, Plates and Tables**

## 5.1 Introduction

The proposed development's construction is set out in the Construction and Environmental Management Plan (CEMP) in this Chapter

This Construction and Environmental Management Plan (CEMP) has been prepared as part of the planning application for the proposed Strategic Housing Development (SHD) at Kilbarry, Cork.

The CEMP considers the proposed works associated with the construction of a strategic housing development of 319 no. residential dwellings comprising of 85no. semi-detached units, 118no. terraced units, 53no. duplex units and 63no. apartments. The development also includes the provision of a crèche facility and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is 33,738.70sqm. The proposed development includes a new junction with the Old Whitechurch Road to the west and a new connection to an existing road which links to the Upper Dublin Hill Road to the east. The development also consists of the demolition of an existing, disused, single-storey commercial building and disused, former stone house ruins near the western boundary. This CEMP will assist with avoiding, reducing, or mitigating construction and environmental impacts arising from the proposed development.

This document has been prepared based on known assessment issues related to construction works management, traffic and transportation measures, air quality, noise and vibration, water and wastewater, landscape management, archaeology, waste management, emergency planning response and inspection and monitoring, all of which are associated with the construction works. This information will be built on prior to commencement of construction in an updated CEMP.

More detailed site-specific measures will be developed and agreed with Cork City Council prior to the commencement of construction works, subject to a successful planning application. The final CEMP will consider any conditions attached to a grant of planning permission.

## 5.2 Proposed Development

### 5.2.1 Existing Site

The application site is at Kilbarry, considered within the north-eastern suburbs of Cork City as defined in the Cork City Development Plan 2022 -2028. Access to/from the site is currently via a junction with Old Whitechurch Road immediately to the west of the site. The existing development lands currently accommodate an existing, disused, and dilapidated, single storey commercial building and existing, disused and dilapidated, former stone cottages/outbuildings, and large open space, treed and vegetated areas used for informal amenity uses and walking. The site is bounded to the north by the Glenamought River. The site is therefore considered predominantly greenfield. Nearby uses include Delaneys GAA club buildings and playing pitches to the east, Kilbarry Enterprise Centre/City North Business Park to the south and existing private dwelling houses to the south-west and west.

The surrounding lands are therefore predominantly a mix of residential and commercial/industrial buildings.

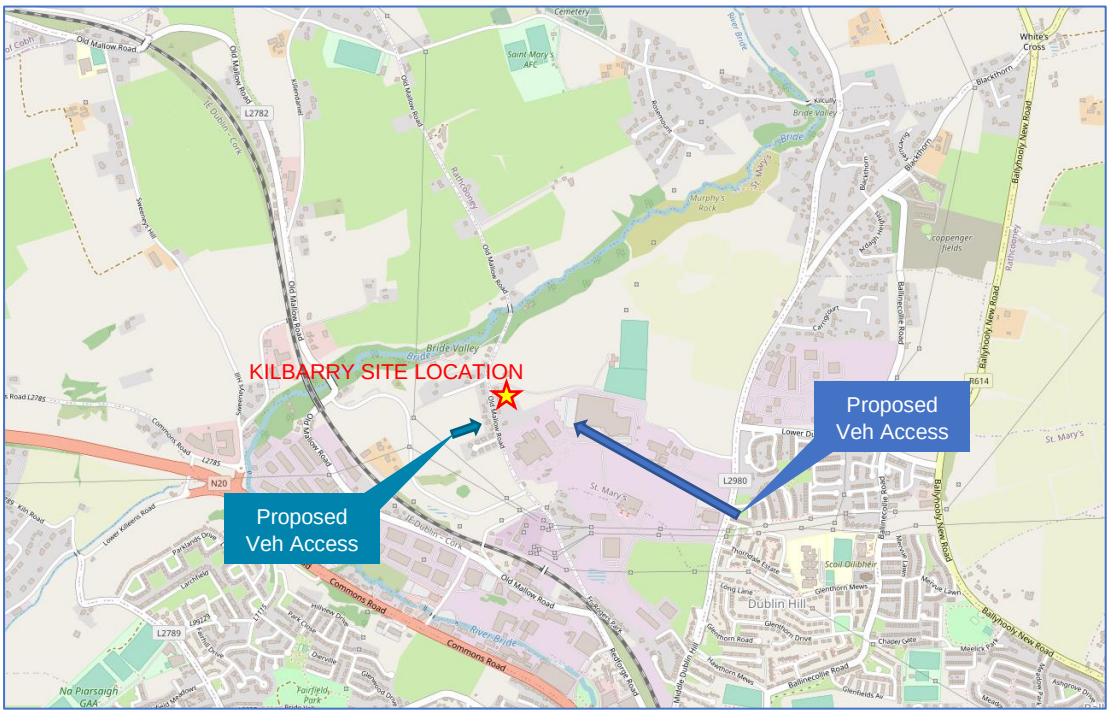


**Figure 5.1: Site location and access route**

### 5.2.2 Proposed Development Site Overview

The proposed development is ultimately intended to comprise 319 no. residential dwellings comprising of 85no. semi-detached units, 118no. terraced units, 53no. duplex units and 63no. apartments. The development also includes the provision of a crèche facility and a riverside amenity park to the north and northeast of the site and associated site development works located on lands bounded by the Old Whitechurch Road, the Glenamought River and the industrial/residential lands to the south.

Permission for the proposed development is being sought under an SHD planning application.

### 5.2.3 Proposed Development

A proposed site layout plan is shown in Figure 5.2 below. The Landscape Plan is included in Appendix 5.1 of the EIAR.

The proposed development provides for the demolition of an existing, disused, single-storey commercial building and disused, former stone house ruins near the western boundary.

The proposal includes an improved vehicle and pedestrian link to the Old Whitechurch Road to the west and a new vehicle and pedestrian link to an existing road which connects to Upper Dublin Hill to the east.

The proposed development provides for outdoor amenity areas including publicly accessible parkland, landscaping, surface car parking, bicycle parking, bin stores, substations, public lighting, roof mounted solar panels, wastewater infrastructure including upgrading of existing infrastructure in the area, surface water attenuation and an outfall to the Glenamought River , water supply infrastructure including upgrading of existing infrastructure in the area and all ancillary site development works.


**Figure 5.2: Proposed Site Layout**

## 5.3 Roles and Responsibilities

### 5.3.1 Client and Contractor

The Applicant will be responsible for ensuring that an appropriate Environmental Management Framework is adhered to, that competent parties are appointed to undertake construction and that sufficient resources are made available to facilitate the appropriate management of risks to the environment.

As part of the Environmental Management Framework, the Building Contractor will need to comply with all relevant environmental legislation, take account of published standards (ISO14001) and relevant documentation including the Environmental Impact Assessment Report (EIAR), any planning conditions from An Bord Pleanala (ABP), this CEMP and the subsequent detailed CEMP. Regarding the subsequent detailed CEMP, the Applicant is responsible for ensuring that this is developed in consultation with the design team and the Local Authority.

The Building Contractor is also responsible for ensuring that all members of the Project Construction Team, including sub-contractors, comply with the procedures set out in the CEMP, including following any specific requirements set-out in the EIAR. The Contractor appointed will be responsible for the organisation, direction and execution of environmental-related activities during the construction of the proposed development. In addition, they will ensure that all persons allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood.

### 5.3.2 Site Manager

A Site Manager will be appointed by the Contractor to oversee the day-to-day management of the site and ensure that effective, safe, and planned construction activities are delivered on an ongoing basis to the highest standards. The Site Manager will be competent, suitably qualified and an experienced professional that will oversee site logistics, communicate regularly with construction staff, accommodate project-specific inductions for staff on-site and ensure that all work is complaint with the relevant design standards and health and safety legislation.

### 5.3.3 Site Environmental Manager (SEM)

A Site Environmental Manager will be appointed by the Contractor to ensure that the CEMP is effectively implemented. The Environmental Manager will be suitably qualified and competent. The responsibilities of the SEM include, but are not limited to, the following:

- Preparing, maintaining, and implementing the CEMP
- Completing site inspection and environmental compliance reports
- Providing guidance for the site team in dealing with environmental matters, including legal and statutory requirements affecting the works
- Reviewing environmental management content of method statements where relevant
- Reporting environmental performance to the Site Manager
- Liaising with statutory and non-statutory bodies and third parties with an environmental interest in the proposed development.

- Conducting regular environmental inspections as specified in the contract and checking adherence to the CEMP
- Keeping up-to-date with relevant environmental best practice and legislative changes
- Ensuring all personnel have undertaken adequate environmental inductions, awareness briefings sand training (including sub-contractors)
- Dealing with environmental complaints
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

### 5.3.4 Environmental Specialists

Where relevant, and to fulfil obligations under the CEMP, the Contractor will be responsible for engaging suitably qualified specialists including (where necessary):

- Project archaeologist;
- Project ecologist;
- Project arborist;
- Noise and vibration specialist;
- Air Quality and dust specialist;
- Land, soils and contamination specialist; and
- Water specialist.

### 5.3.5 Training and Induction

**Site Induction**

All personnel involved in the proposed development will receive environmental awareness training. The environmental training and awareness procedure will ensure that staff are familiar with the principles of the CEMP, the environmental aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.

**Specific Training and Awareness Raising**

A project specific training plan that identifies the competency requirements for all personnel allocated with environmental responsibilities will be produced by the Contractor. Training will be provided by the Contractor to ensure that all persons working on site have a practical understanding of environmental issues and management requirements prior to commencing activities. A register of completed training is to be kept by the SEM. The Site Manager will ensure that environmental emergency plans are drawn up and the SEM will conduct the necessary training/inductions.

## 5.4 Construction Works Management

### 5.4.1 Proposed Construction Sequencing

The construction of the development will include the construction and completion of 319 no. residential dwellings comprising of 85no. semi-detached units, 118no. terraced units, 53no. duplex units and 63no. apartments. The development also includes the provision of a crèche facility and a riverside amenity park to the north and northeast of the site and associated site development works and all ancillary works. The development will be completed in three phases, with the first phase of 100 units serviceable without the requirement for infrastructure upgrades outside of the site by Irish Water. The second and third phases of the development will include approximately 110 units in each phase, subject to final detailed agreement with the Local Authority and utility providers. See Appendix 5.2 of the EIAR for a proposed phasing plan layout.

See attached phasing plan drawing attached. The final phasing of the development will be subject to later agreement with the Local Authority when final planning approval is achieved, and final planning conditions are understood and addressed.

Prior to any Phase 1 construction works being carried out, the proposed development will initially involve some site clearance, the demolition of existing, disused commercial buildings and stone houses structures and earthworks in order to clear and grade the site to accommodate the construction of all associated engineering works and subsequently the building foundations.

This will involve the delivery of machinery, site equipment/plant and materials and the removal of some material off-site. Any material that can be reused later in the construction process will be stockpiled in an appropriate location; this will reduce the number of vehicular movements on the public roads. Once the site access, parking and compound facilities are established, the main haulage of materials to the site will include stone, concrete, blocks, steel and other building materials. Appropriate traffic management measures will be provided to minimise the impact of construction traffic on the local road network as detailed in Section 4 of this report.

An indicative construction sequence is outlined below to illustrate the buildability of the project. The actual construction sequence will be confirmed when any conditions of planning are received, and construction appointments confirmed.

To develop the site, the following works will be required to be carried out:

- Provision of a temporary construction access from the Old Whitechurch Road and the Upper Dublin Hill Road into the site, provision of a safe and secure site compound including welfare facilities for workers and the erection of temporary boundary fencing.
- Measures, including temporary fencing, to reduce the potential risk of impacts to retained trees, the butterfly habitat area and open space areas in the northern sector of the site.
- Fencing to protect the Marsh Fritillary habitat area in the north-west sector of the site
- Creation of a storage area for surplus plant and materials.
- Creation of a site batch concrete area.

- Installation of silt fencing and creation of silt traps to the north of the construction area of the site to prevent construction runoff towards natural vegetation, the butterfly habitat area and the Glenamought River watercourse.
- Demolition of existing commercial and stone buildings and sheds.
- Trenching for underground services including foul sewer, surface water drainage including attenuation and outfall pipework, water mains, gas, telecommunications, electricity and lighting.
- Construction and connection of underground services to existing underground services, principally connections to the Old Whitechurch Road.
- Surface water connection will be made to the existing Glenamought River on the northern boundary of the site. This outfall pipe will require to be directionally-drilled under the Marsh Fritillary habitat area to avoid impact on that habitat. This will involve the use of a specialist contractor. The final outfall to the River will be constructed as an open channel through existing vegetated areas to ensure minimum environmental impact.
- Watermain connections will be made to the existing watermain in Old Whitechurch Road.
- Foul sewer connection will be made to the existing foul sewer in Old Whitechurch Road.
- No dwelling unit will be occupied prior to the completion of an approved foul sewer connection and no hard-standing area will be completed without the final surface water outfall being in place.
- Excavation and concrete works for strip and pad footing foundations.
- Piling to some blocks, in areas of previously-placed fill, likely to be bored piles with in-situ concrete and rebar infilling.
- Construction of the apartment buildings and houses, likely to be constructed in reinforced-concrete frames and timber frames respectively, and construction of all plant and storage areas,.
- Construction of ancillary site works including the provision of 4 substations, outdoor amenity areas, landscaping, car parking spaces, motorbike spaces, bicycle parking spaces, bin stores, public lighting, and all supporting site development works.
- Erection of permanent boundary fencing, landscaping, and lighting.

For later phases of the development foul sewers and watermains in Old Whitechurch Road will have to be upsized to serve the proposed development. This work will be carried out by Irish Water and specific construction controls will be put in place by Irish Water and their contractors for this work. The details of this work and the associated construction controls will be a matter for later detailed agreement between Irish Water and Cork City Council but will involve traffic management and traffic controls on Old Whitechurch Road to facilitate safe construction while facilitating existing traffic.

It is estimated that the full construction of the development will take 36 months to complete, with approximately 12 months construction for each of three phases.

### 5.4.2 Working Hours

It is envisaged that normal working hours will be between 7:00am and 6:00pm, Monday to Friday and 8:00am to 2:00pm on Saturdays, subject to any conditions set down by An Bord Pleanála/Cork City Council. No working will be allowed on Sundays or Bank Holidays. Subject to the agreement of the local authority, out-of-hours working may be required for water main connections, foul drainage connections, tower crane erection and removal etc. Any such arrangements will be agreed at construction stage.

Working hours for water supply and foul sewer upgrades on Old Whitechurch Road will be agreed with Irish Water and Cork City Council for the later phases of the development and work outside of normal working hours may be required for significant connections to existing infrastructure.

### 5.4.3 Cranes and Lifting of Equipment

The proposed build method for the apartment blocks is likely to be as a reinforced concrete (RC) frame. Tower cranes and concrete placing booms will be required to erect the RC frame. A combination of goods hoists and telehandlers will offload and distribute materials for the construction and finishing trades.

The proposed houses are likely to be constructed using timber frame technology which will require the use of mobile cranes to lift sections of timber kits into place on an ongoing basis as house construction progresses.

All lifting equipment and appliances will carry current test certificates and be inspected prior to use. Trained and competent bankmen will attend the cranes.

Road closures may be required for a short period to enable the cranes to be transported to/from site. The appropriate approvals and permits for any road closures will be applied for and agreed with Cork City Council. All relevant stakeholders will be kept informed of any such closures.

### 5.4.4 Site Storage

Storage of materials on site will be kept to the minimum. A construction programme will be developed to ensure that no large materials will be required to be stored on-site until they are needed. Materials such as glazing and cladding systems will be delivered in batches and loaded evenly on the required floors. Throughout the project, storage of materials outside the site boundary or in areas of landscape and ecological value within the site will not be permitted.

### 5.4.5 Site Safety and Access/Egress

Appropriate management of the transport operations will be applied throughout the construction process. Construction site compounds and staff parking areas will be set up before any construction works start on-site. The site compounds will be located within the site's boundary at appropriate locations as shown in Figure 5.3 The site compound established for the Phase 1 development is likely to be maintained through the later phases of the development. Hoarding and boundary fencing will be erected to delineate all site works and separate same from the surrounding public areas located adjacent to the development.

Staff parking during construction will be accommodated close to the site compound with access from Upper Dublin Hill generally.

There will be construction access from the Old Whitechurch Road and the Upper Dublin Hill road and final arrangements for such access will be agreed before construction works commence and will be carefully managed throughout the works.

As construction progresses the completed Phase 1 and Phase 2 areas of the development will have permanent access from Old Whitechurch Road with construction access from Upper Dublin Hill to avoid

construction travel through completed areas of the development. This will ensure a separation of construction and permanent user access until the construction works are completed.

Works on upgrades to existing water supply and foul sewer pipework on Old Whitechurch Road, by Irish Water, will require traffic management and controls to be employed on Old Whitechurch Road, including managed single-lane traffic flows to facilitate this pie-laying work.

A detailed Construction Traffic Management Plan will be prepared by the Contractor and submitted to the Planning Authority prior to the commencement of any construction on the development site and Irish Water Cork City Council will agree a Traffic Management Plan for the works on the Old Whitechurch Road.

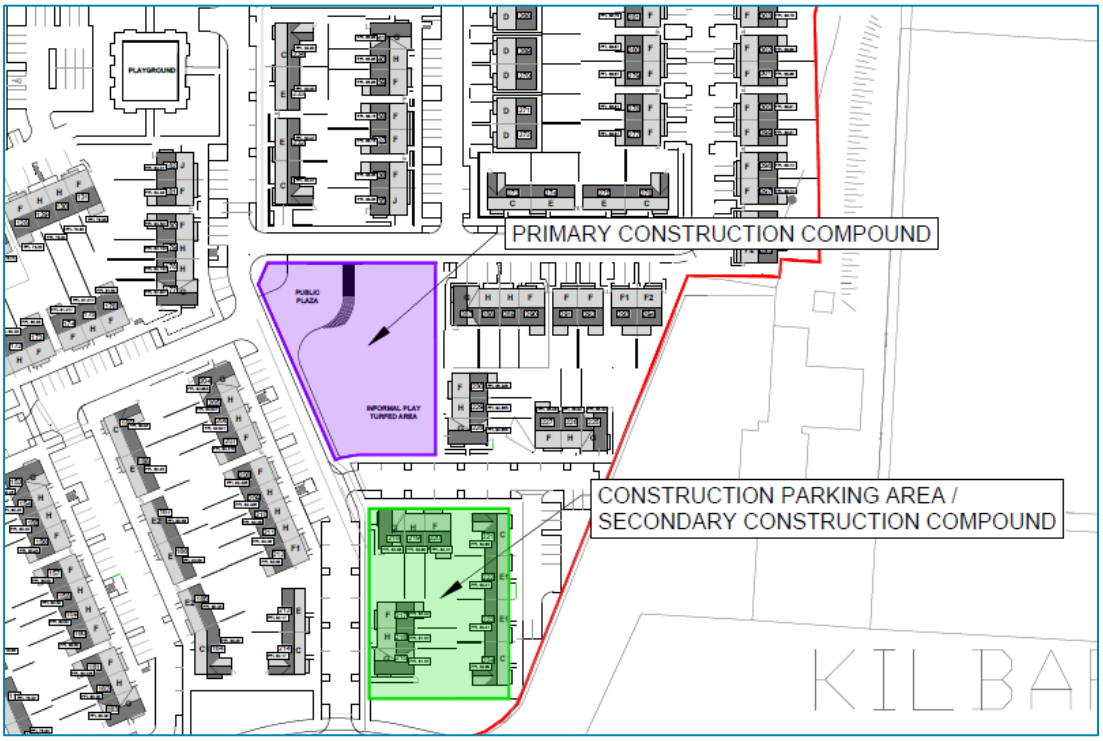


**Figure 5.3: Site Compound Location**

Security of the site is an important issue with respect to restricting site entry to personnel solely involved in the construction process during working hours and preventing unauthorised access out of hours. Site access for all personnel and visitors will be strictly controlled and all visitors will report to the site office prior to entering the construction area.

## 5.5 Traffic & Transportation Measures

### 5.5.1 Introduction

Chapter 5 of the EIAR and the Traffic and Transport Assessment (TTA) and Mobility Management Plan (MMP) prepared by MHL Consulting Engineers addresses any significant potential impacts in respect of traffic during the construction phase. It is outlined in the TTA that a detailed Construction Traffic Management Plan (CTMP) will be prepared by the successful contractor in consultation with Cork City Council Roads and Transportation Department. This CTMP will address the requirement for pipe upgrading works, by Irish Water, on the Old Whitechurch Road at later phases of the development

The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction phase upon the public (off-site), existing private property owners on or adjacent to the site boundaries, occupiers of early phases of the development (adjacent to the construction works), visitors to the subject site (on-site) and internal (on-site) workers environment are fully considered and proactively managed/programmed, thereby ensuring that safety is maintained at all times, disruption is minimised, and that works are undertaken within a controlled, hazard-minimised environment.

### 5.5.2 Access Control

The proposed construction site is located off south-east corner of the site via the existing road which serves the Delaneys GAA complex and the existing IDA lands to the south-east and which links to Upper Dublin Hill further to the east. The site was previously accessed off the Old Whitechurch Road. See Figure 5.1. The proposed development is approximately 620m from the junction with Upper Dublin Hill and is immediately adjacent to the Old Whitechurch Road to the west. These two entrances will be the main access points from the wider road network and will form the preferred haulage route to/from the site in agreement with Cork City Council.

It is anticipated that heavy goods vehicles will be restricted to off-peak times on the local road network to reduce the impact on the road network during the morning and evening peaks. It is expected that HGV movements and general deliveries will otherwise arrive/leave throughout the day at a steady rate.

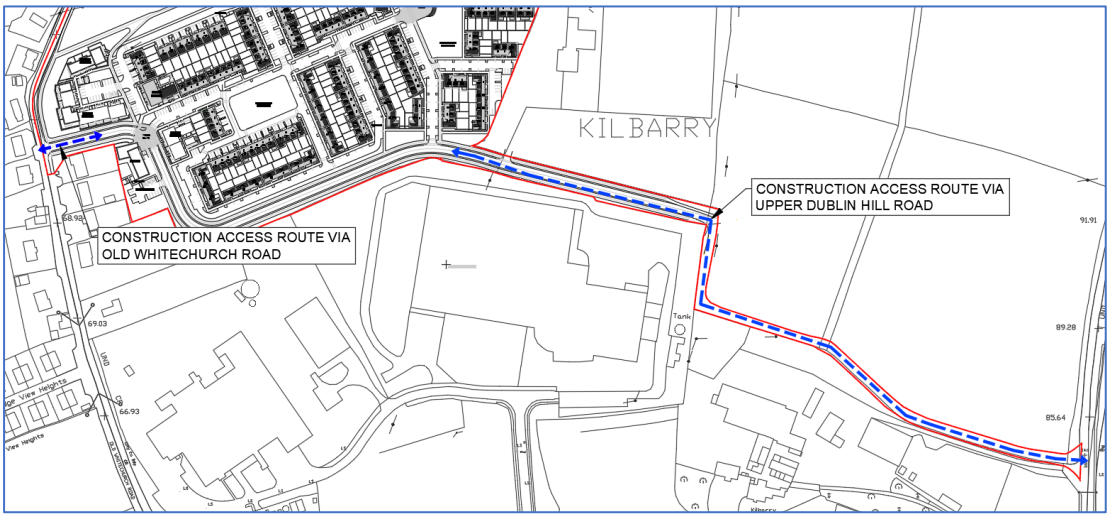


**Figure 5.4: Proposed Operational / Construction Site Access**

Appropriate signage for the site will be provided on the approach routes to provide clarity for construction vehicles, particularly deliveries who may not be familiar with the site location. This will provide wayfinding for drivers and limit the number of turning manoeuvres outside the site.

The following section includes a range of mitigation measures to minimise the construction traffic generation, ensure the safety of the workforce on the site and accessing the site, and ensuring the safety of the public on the surrounding roads.

### 5.5.3 Construction Related Traffic Movements

The demolition, site clearance, piling and general construction activities will generate a level of vehicle movement to and from the site as well as internally within the subject site.

The typical construction trips generated during site clearance and construction comprise:

- Construction employees arriving and leaving work
- Deliveries and removal of machinery; and
- Delivery and removal of materials.

Appropriate measures will be put in place to ensure safe access to/from the site. Measures will also be implemented on-site to ensure safe manoeuvres can be carried out within the construction site. A construction site car park will be located within the Applicant's lands. There will be designated areas on site for loading/unloading and a specified storage area for materials and machinery. A waste and recycling area will be established within the construction site boundary, close to the construction access, to prevent unnecessary trips through the site for collection. To ensure that the internal site routes and the public roads to the construction site entrance are kept in good condition, a wheel washing facility will be located close to the exits from the construction area to minimize mud and dust.

The pipe upgrade works on the Old Whitechurch Road will be managed principally by Irish Water at later phases of the development, subject to detailed discussions with Cork City Council and the main contractor for the development works. Co-ordination of main works and pipe upgrade works will be required to ensure that traffic on the Old Whitechurch Road will continue to be facilitated.

The level of construction traffic throughout the working day is expected to be low to moderate, the highest volume of vehicles is expected when workers arrive to and leave work. Generally, workers are expected to travel by private vehicle and public transport. It is expected that there will be a typical average of approximately 80 no. construction employees on site during each phase of the works.

Deliveries and HGV movement numbers are expected to be low to moderate and evenly spread throughout the day. The HGV traffic is expected to be greater during the initial stage of the development as larger machinery and materials will be delivered. This will, however, reduce as the construction of the buildings advance.

Deliveries of materials to site will be planned to avoid high volume periods where possible, particularly the AM peak hour. There may be occasions, however, when it is necessary to have deliveries within these

periods. As previously stated, the Contractor will develop, agree and submit a detailed Construction Traffic Management Plan to the local authority for approval prior to commencement of construction works. The following section details some of the mitigation measures to be included in the detailed CTMP.

### 5.5.4 Mitigation Measures

A competent traffic co-ordinator and banksmen will be appointed by the contractor to oversee the following control measures which will be implemented as part of the final CTMP to reduce the risks associated with construction traffic. Some of the following measures also tie in with mitigation measures for dust and noise.

- A detailed site plan/layout of the construction site will be developed to identify locations for site offices/storage areas/waste management areas etc.
- Entrances and exits – separate entry and exit gateways will be provided for pedestrians and vehicles with a gate attendant employed to interface with the traffic and public to facilitate safe access and egress of vehicles.
- Where employees will need to cross the construction route, a clearly signed and lit crossing point will be provided where drivers and pedestrians can see each other clearly.
- Visibility – the site operator will ensure that drivers driving out onto the public roads have the appropriate visibility splays.
- The existing site accommodates significant numbers of public, informal walkers who use the areas for amenity purposes. All such amenity routes will be cordoned-off from construction areas to ensure the safety of the public.
- All operators of construction machinery and vehicles will be trained and competent and have valid CSCS cards.
- All site staff will be made aware that there are employees and visitors to the GAA grounds in the surrounding areas using the construction access roads.
- Approach signage with good sightlines will be provided at the site access route and site entrance.
- Traffic management measures will be co-ordinated such that works on the main site and works on pipe upgrades on the Old Whitechurch Road, by Irish Water, are fully co-ordinated.
- Traffic management procedures will be communicated to suppliers and workers.
- Deliveries to site will be planned to arrive during working hours only, save for exceptional loads for which a detailed plan will be agreed with the local authority..
- The access routes to the construction site entrances and internal site routes will be kept in good condition and clear of obstructions.
- The contractor will put measures in place to mitigate any excessive noise for nearby properties that may be created during construction activities.
- Internal trafficked areas will be watered twice daily on dry days to reduce dust, if required. Vehicles delivering or collecting material with dust potential will be covered with tarpaulin at all times to restrict the escape of dust.
- A stringent 'clean as you go' policy will be implemented on site to ensure no loose material is left on the ground within the construction access road and the public road.
- Vehicle wheel washing facilities will be in place for vehicles leaving the construction site area.
- A road sweep will be deployed if necessary to ensure the site access route between the site access and the Upper Dublin Hill junction, and the Old Whitechurch Road, will be kept clean at all times.

- Construction materials or equipment will not be stored outside the site boundary.
- Pedestrian/vehicular routes, crossing points, parking, loading and vehicle only areas will be clearly marked, signposted and segregated as appropriate.
- Where required site vehicles will be fitted with appropriate audible and visual devices.
- Loading and unloading will be carried out in a designated area within the construction site boundary and reversing activities will be kept to a minimum.
- Loads will be checked prior to unloading and loads will be adequately secured for travel.
- Visitors to site will be accompanied and a safe area will be provided for visiting drivers during loading and unloading.
- Speed limits signage will be used to control speeds on the access route and within the construction site.
- Construction vehicles and machinery will be maintained in good condition by a competent person as per the manufacturer's instructions. A dedicated area for maintenance work will be provided within the construction site area.
- All operators will wear personal protective equipment on-site and seat belts, where fitted by the manufacturer, will be worn when operating equipment.

## 5.6 Air Quality

### 5.6.1 Introduction

As construction activities are likely to generate some dust emissions, dust management requirements will be developed and implemented as part of the Dust Mitigation Plan during the construction phase. The potential for dust to be emitted depends on the type of construction activity being carried out, the dust controls in place and also the weather conditions, such as the level of rainfall, wind speed and direction.

### 5.6.2 Dust Sources

The potential impact for dust depends on the distance to potentially sensitive locations, such as neighbouring residential and commercial properties and sensitive environmental receptors in this case. The main activities that give rise to dust emissions during construction include the following:

- Excavations and Piling
- Materials handling and storage
- Temporary stockpiling of any earthworks material for re-use
- Movement of vehicles, particularly HGVs.

The mitigation measures set out below will be put in place during the construction phases. The level of dust control to be implemented will depend on the weather conditions, the specific construction activities (e.g. earthworks activities, construction activities and site vehicle movements) and the potential for dust nuisance as a result of those activities.

### 5.6.3 Mitigation Measures

Mitigation measures for dust control will include:

- The contractor shall prepare a dust minimisation plan which shall be communicated to all staff.
- Internal trafficked areas will be watered twice daily on dry days to reduce dust if required. Vehicles delivering or collecting material with dust potential will be covered with tarpaulin at all times to restrict the escape of dust.
- A stringent 'clean as you go' policy will be implemented on site to ensure no loose material is left on the ground within the construction access road and the public roads.
- Vehicle wheel washing facilities will be in place for vehicles leaving the construction site area.
- While works on pipe upsizing on Old Whitechurch Road are underway, by Irish Water, road sweeping/wheel washing will be undertaken to ensure dust minimisation.
- The road linking the site to Upper Dublin Hill and the Old Whitechurch Road public road will be inspected daily for cleanliness and a road sweep will be deployed if necessary to ensure the site access route between the site access and the Upper Dublin Hill road junction, and the Old Whitechurch Road, will be kept clean at all times.
- Topsoil stockpiles will be located in a location so as not to necessitate double handling and topsoil stockpiles will be seeded to promote grass growth and reduce dust.
- Material handling systems and site stockpiling of materials will be laid out to minimise exposure to wind.
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.

## 5.7 Noise and Vibration Control Measures

### 5.7.1 Introduction

In order to minimise the noise impact on the adjoining community, commercial, sporting and residential properties it is proposed that heavy equipment and machinery including piling drills (if required), pipe-drilling machinery, excavators, construction vehicles and generators only work between the hours detailed below. In addition, no deliveries and/or removal of materials will occur outside of these hours, save for exceptional situations when permissions will be sought from the Local Authority.

Normal working hours are outlined in Section 3.2 above, however these will be subject to detailed agreement with Cork City Council prior to commencement.

On occasions it may prove necessary to carry out construction activities outside of normal working hours. In such instances prior consultation will be carried out with Cork City Council, local residents, and businesses outlining the nature and reason for the works and their likely duration.

### 5.7.2 Noise and Vibration Regulations

During the works the contractor shall comply with the requirements of BS 5228-1:2009+ A1:2014 and BS 5228-2:2009 +A1:2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites) as well as Safety, Health and Welfare at Work (General Applications) Regulations 2007 Noise and Vibration.

**Noise Limits**

Noise limits to be applied for the duration of the construction works are as set out in BS 5528. This applies a noise limit of 70dBA between 07:00 and 19:00 outside the nearest window of the occupied room closest to the site boundary in suburban areas away from main road traffic and industrial noise.

For the duration of the construction works, a daytime noise limit (07:00 to 19:00) of 70 dBA shall apply (in accordance with BS 5228).

**Vibration Limits**

Vibration limits to be applied for the duration of construction works are as set out in BS 5228 (Code of Practice for Vibration Control on Construction and Open Sites) and BS 7385:1993 (Evaluation and measurement for vibration in buildings Part 2: Guide to daameg levels from ground borne vibration). Allowable vibration during the construction phase is summarised below in Figure 5.5.

| 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 4Hz | 15 to 40Hz | 40Hz (and above) |
| 12 mm/sa | 12.5 mm/sa | 50 mm/sa |

**Figure 5.5: Guidelines for Allowable Vibration**

### 5.7.3 Mitigation Measures

In particular, the following practices are to be implemented during the construction phase:

- Limiting the hours during which site activities that are likely to create high levels of noise and vibration are permitted
- Erection of a barrier along the construction site boundary (e.g. standard 2.4m high construction hoarding and additional, higher hoarding at boundaries with adjacent existing buildings) to remove direct line of sight between noise sources and receiver when construction works are being carried out in proximity to noise sensitive receivers
- Rock excavation by digging and ripping rather than by use of a rock-breaker. Blasting of rock will not be required on the site.
- Establish channels of communication between the contractor, local authority and local businesses/local sports facility owners and residents
- Appoint a site representative (SEM) responsible for matters relating to noise
- Selection of plant with low inherent potential for generation of noise
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints and implementation of noise reduction measures such as acoustic enclosures when required
- Avoidance of unnecessary revving of engines and switching off of plant when idle
- All plant and equipment will be maintained in good working order in accordance with BS.5228 in order to minimise air and noise emissions.
- All ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers, and where commercially available, dampening tools and accessories shall be used.
- Noise monitors will be erected, and data collected to assess sound levels.
- Ear protection zones will be established, and all personnel will be trained on ear protection.

## 5.8 Water and Wastewater Controls

### 5.8.1 Introduction

All works carried out as part of these works will comply with all Statutory Legislation including the Local Government (Water Pollution) Act, 1977 and 1990 (as amended) and the contractor will cooperate in-full with Irish Water and the Environmental Department of Cork City Council. The Glenamought River is located along the northern boundary of the overall site, some 130 m from the edge of the proposed residential development works.

The following description outlines the proposed water/wastewater works to be carried out during each phase:

- Surface Water - The proposed surface water network will include a drainage pipe network, attenuation storage and SuDS features. The restricted discharge from the site will be conveyed in a directionally-drilled underground pipe for part of the outfall route and then in a new open surface water channel laid from the northern boundary of the western side of the site in a northerly and easterly direction across the open space area to the north of the development area to a final outfall to the Glenamought River.
- Foul Drainage - Wastewater collection within the proposed development will be via a network of 150mm and 225mm diameter gravity sewers, which will direct the flows to the western side of the site. This new gravity sewer will then connect directly to the existing foul sewer on Old Whitechurch Road. The first 100 units of the development can be served by this existing foul sewer. Later phases of the development will be served by an upgraded foul sewer, the upgrading works to be carried out by Irish Water, for which Irish Water will levy the Applicant and which work will take place as the development is progressed beyond the first phase.
- Potable Water - A 150mm diameter watermain is located in Old Whitechurch Road immediately to the west of the site. Irish Water have advised that the connection to serve the development is to be made to this existing main. The first 100 units of the development can be served by this existing watermain. Later phases of the development will be served by an upgraded watermain, the upgrading works to be carried out by Irish Water, for which Irish Water will levy the Applicant and which work will take place as the development is progressed beyond the first phase.

The mitigation measures outlined below provide the water management controls required to be implemented by potential Contractors and Sub-contractors and set out the proposed procedures and operations to be utilised on the proposed development to mitigate against any water related environmental impacts. The mitigation and control measures outlined herein will be employed on site during the construction phase of the development.

The main areas of water related concerns covered by this section are:

- Pre-Construction (Inc Site Clearance/Tree felling)
- Construction Phase drainage controls
- Earthworks (i.e. infrastructure & drainage) and surface water quality protection
- Temporary stockpiles water management and controls; and
- Fuel usage, storage and management.

### 5.8.2 Mitigation Measures

Surface water runoff during site clearance and construction stage can be potentially contaminated. The most likely forms of contamination are 'siltation' and spillage. Siltation occurs when soil and particulate matter are washed away in rainfall events by rainwater. Siltation will be mitigated on the project using silt fencing, stilling basins and strainers within the site to prevent silt being discharged to the existing drainage network and watercourses.

**Excavation, Erosion and Sediment Control**

- Measures will be implemented to capture and treat sediment laden water run off (e.g. silt fences, silt traps; siltbuster).
- The area of exposed ground will be minimised and as much vegetation as possible will be retained for as long as is practical.
- Clearing and topsoil stripping of each area will be delayed until work is ready to proceed.
- Closing and backfilling of trenches will take place as soon as practically possible.
- Any earthworks temporary stockpile areas will require silt fencing to be installed upstream of sensitive areas.
- Any on-site settlement areas are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.
- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement areas prior to discharge of surface water at a controlled rate.
- Surface water discharge points during the construction phase are to be agreed Cork City Council's Environment Section prior to commencing works on site.
- Arisings from directional drilling will be stored in sealed tank units to ensure that no silt/mud-laden discharges escape to ground. A specific method statement for this work will be agreed with the Local Authority and site ecologist before this work commences as it will take place close to the butterfly habitat area.

As fuels and oils are required during construction stage, it is necessary to mitigate the possibility of there being an accidental leakage of these liquids. All fuels stored on site will be bunded and all chemicals will be stored in an appropriate tank. Should any spillage occur on site during construction, it is likely that there will be a localised moderate impact in the short term on the environment.

**Accidental Spills and Leaks**

- All oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand (impervious) area
- Refuelling and servicing of construction machinery will take place in a designated hard stand area which is also remote from any surface water inlets or sensitive receptor areas.
- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of equipment.

**Concrete**

- Concrete batching will take place on-site and offsite. Wash down and wash out of concrete trucks will take place off site and any excess concrete will not be disposed of on site.

- Pumped concrete will be monitored to ensure there is no accidental discharge.
- Mixer washings are not to be discharged into surface water drains and will be directed to settlement areas.

**Wheel Wash Areas**

- Discharge from any vehicle wheel wash areas is to be directed to onsite settlement areas, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.

Through consultation with the Site Manager (SM) /Site Environmental Manager (SEM), a schedule for surface water quality monitoring will be drawn up. This will be finalised prior to the start of construction. Where monitoring parameters are found to exceed the standards laid down, the SM/SEM will initiate and report corrective actions. This may necessitate the alteration of the environmental control measures and in turn the relevant construction method statement.

It is proposed to implement a programme for monitoring water quality at the outfall tie-in as part of the construction of this development, in agreement with the Planning Authority. This programme and sampling requirements will be agreed with Cork City Council.

## 5.9 Landscape Management

During each phase of construction, site security fencing and solid hoarding will be used where appropriate to restrict visibility, minimise noise pollution and restrict visibility into the site, minimising the temporary landscape and visual impacts. There is a significant area of existing vegetation/trees to the north of the development works site and along the routes of surface-water outfall/connections. These areas will require protection measures to be employed during construction works, particularly during the construction of the stormwater attenuation area and the storm outfall to the river. The stormwater outfall route has been designed to avoid the need to remove significant trees and to have the least possible impact on existing vegetation and this aspect of the work is addressed elsewhere, in detail, as part of the EIAR.

To protect the habitat area for the Marsh Fritillary butterfly this area will be cordoned-off to ensure that no construction work will take place within this area. The stormwater outfall pipe from the attenuation storage area to the outfall is to be directionally drilled under this habitat area to ensure that no excavation works will take place through the habitat area.

The mitigation measures set out below will be implemented to minimise the impact on any trees/vegetation.

Although the removal of some trees will be required for the construction of the surface water outfall channel such tree removal will be restricted to that identified for removal in the application.

- All mitigation measures to be put in place to protect such trees and vegetation shall be prepared in consultation with a qualified Arborist, who shall supervise works for which an Arboriculture Method Statement is required.
- The specific Arboriculture Method Statement shall be prepared for any works within the root protection area of any tree to be retained and the measures outlined shall be strictly enforced on site.
- Trees will be protected in accordance with BS: 5837:2012 *Trees in relation to design, demolition and construction. Recommendations* and any further agreed procedures.
- The construction works close to the butterfly habitat area will be fenced off and protected from construction vehicles and equipment. The contractor will liaise and co-ordinate these works with the site ecologist and with Cork City Council.
- Reinstatement of trees and vegetation will be undertaken by a suitably qualified landscape contractor.

## 5.10 Archaeology & Heritage

### 5.10.1 Pre-Construction

Prior to any construction commencing, an archaeological and heritage assessment and surveys will be carried to include advance archaeological testing across the footprint of the development where machine or hand excavated test trenches allow for the early indication of relevant material. This allows for informed decisions to be made as to how best to progress with construction works and deal with any discovered archaeological finds should they arise.

Based on the results of the above assessments/surveys, detailed monitoring of all groundworks associated with the development may be recommended, with the provision for full excavation of any archaeologically significant material uncovered.

### 5.10.2 During Construction

Following the archaeological and heritage assessment, during the construction process, if deemed necessary, archaeological monitoring will be carried out where the construction works are suspected to be in the proximity to an archaeological site. This may involve a forensic archaeologist or human osteoarchaeologist maintaining a watching brief while groundworks are taking place in order to identify and record any archaeological remains that may be present. In the event of archaeological features or material being uncovered during construction monitoring, it is important that all machine work in the immediate area ceases to allow the archaeologist to assess, excavate and record any findings.

Should archaeological features or material be uncovered, adequate funds to cover excavation, fencing, post-excavation analysis and reporting will be made available. This work should be done under license in accordance with Section 26 of the National Monuments Act 1930-2014 and with a method statement agreed in advance with the National Monuments Service (Dept. of Culture, Heritage and the Gaeltacht) and the National Museum of Ireland.

### 5.10.3 Mitigation Measures

A programme of archaeological supervision/monitoring of all ground works will be undertaken by a suitably-qualified archaeologist. Given the developed nature of portions of the site the archaeological risk is considered to be low. In the unlikely event of an archaeological discovery, the National Monuments Service and Cork City Council will be consulted to agree how the encountered archaeological remains are recorded and resolved.

## 5.11 Waste Management

### 5.11.1 Introduction

A detailed Construction Waste Management Plan will be agreed with Cork City Council and put in place in order to control waste management on site, ensure segregation of waste streams and minimise construction waste costs. Waste arising from the site will be considered in relation to the waste management hierarchy of prevention, reduce, reuse, recycle, energy recovery and disposal.

Construction and demolition waste is the largest "municipal" waste stream contributing to the current pressure on landfill facilities in the region. Unsustainable management and inappropriate disposal of this waste stream can result in impact on natural resources and lead to environmental pollution. The main source of waste material at the site will be construction waste.

Waste is defined as any substances or object belonging to a category of waste specified in the First Schedule (of the Waste Management Act 1996) or included in the European Waste Catalogue, which the holder discards or intends or is required to discard and anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste until the contrary is proved.

There are two main types of construction waste – Hazardous and Non-hazardous as detailed below:

**Non-hazardous**

- Timber Waste
- Scrap Metal
- Plastic
- Paper / Cardboard
- Canteen Waste
- Litter

**Hazardous**

Hazardous Wastes are defined as wastes which can have a harmful effect on the environment and on human health as they exhibit ignitability, reactivity, corrosivity and/or toxicity and/or are listed as hazardous by the European Waste Catalogue and/or may be identified as hazardous by application of the EPA Waste Characterisation Tool compiled by The Clean Technology Centre.

The hazardous wastes that may be experienced at a development of this nature are as follows:

- Adhesives and Sealants
- Aerosols
- Batteries
- Chemicals
- Cleaning Products
- Oil (Contaminated absorbent Material or debris)
- Paints and Thinner
- Fuels (hydrocarbons such as diesel)
- Concrete waste

The proposed development will result in the generation of waste material from the following sources:

- Removal of existing boundaries
- Demolition of existing buildings and stone ruins
- Excavation of soil for site access, to foundations, ductwork and sewers/watermains
- Excavation of stone / made ground across the site to achieve proposed development levels
- Surplus material (off-cuts, damaged materials, packaging etc.) generated during the construction of the new development.

Soil will be excavated to facilitate construction of foundations, access roads, the installation of site services and general landscaping. Where possible, excavated topsoil will be reused on site for landscaping.

It is anticipated that any surplus material cut from the previously-filled area of the site in the south-east area of the site will be removed from the site as it will have be the least valuable material for re-use on the site. This will be disposed of to an approved site for re-use and/or recovery or to a licenced waste site.

Material cut in other areas of the site will be re-used on site to create the proposed development levels, subject to a detailed soils management strategy.

The Waste Management Hierarchy states that the most preferred option for waste management is prevention and minimisation of waste, followed by reuse and recycling/recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. Excavations are required to facilitate construction of the development and the majority of the material excavated will be re-used within the development. There will be a surplus of excavated material so the preferred option (prevention and minimisation) cannot be fully accommodated for the bulk excavation phase.

The next option (beneficial reuse) may be possible for most, and potentially all, of the inert natural material (Category A1). Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end-use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of the material is to be reused on another site European Communities (Waste Directive) Regulations 2011, Article 27 requires that certain conditions are met and that by-product decisions are made to the EPA, via their online notification form.

If the material 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 Acts 1996-2008, the Waste Management (Collection Permit) Regulations 2007 (as amended) the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste removed will dictate whether a Certificate of Registration (COR), Waste Facility Permit or Waste Licence is required by the receiving facility.

Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered. The option of disposal of inert natural material to landfill will only be considered once all available reuse options have been explored and where capacity cannot be secured at appropriately permitted/licensed facilities for recycling or recovery purposes.

Any soil/subsoil that is deemed to be contaminated will be stored separately to the clean and inert soil/subsoil. The material will be appropriately tested and classified as either non-hazardous or hazardous in accordance with the EPA publication 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' using the HazWasteOnline application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous, or hazardous in accordance with the EC Council Decision 2003/33/EC.

The highest volume of materials generated will be topsoil and subsoil/stones from site clearance to accommodate access routes, footpaths, services, and foundation excavation to enable construction of the houses and apartment blocks. Some of the material will be re-used on site, however, some will be removed off-site. Given that the proposed developable area is approximately 9 hectares, the following estimations of excavated material have been calculated:

- An average depth of 300 - 400mm for topsoil strip across the developable area of the site will generate approximately 19,230 m3 of topsoil.
- Bulk subsoil excavation for access route and footpath construction, piling and excavation for foundations in the previously filled area of the site will generate approximately 21,270 m3 of material.
- Excavation for watermains, foul and surface water sewers in this previously filled area will generate approximately 3,225 m3 of material.
- Bulk subsoil excavation in the remaining site will generate approximately 13,390 m3 of material.
- Excavation for watermains, foul and surface water sewers and attenuation storage areas will generate approximately 12,500 m3 of material.
- The total subsoil excavation is therefore approximately 34,385 m3.
- Approximately 2,100 m3 of fill material will be required in the previously filled area of the site to achieve proposed development levels.
- Approximately 33,440 m3 of fill material will be required in the remainder of the site to achieve proposed development levels.

As such, it is estimated that approximately 18,075 m3 of material will need to be transported off-site for reuse/recycling, mainly from the previously filled area of the site. (See Table 5.1).

Also, the demolition of the existing building and stone ruins on the site will generate quantities of rubble/stone, structural steel and corrugated metal roof sheeting. It is unlikely that any of this material will be re-usable on site so this material will have to be taken off-site to approved recycling/recovery facilities. Surveys to date have established that there is no asbestos materials in these existing buildings, and this will be confirmed at pre-demolition stage.

An estimated 435 m3 of rubble/stone will be generated, with approximately 8 tonnes of structural steel and 2 tonnes of corrugated roof sheeting.

A standard 4-axle rigid construction tipper capacity weight is 20 tonnes which is equivalent to approximately 11 cubic metres of soil. Therefore, approximately 1,640 HGV loads will be required to export the excess soil off-site, while a further 42 HGV loads will be required to export the demolition waste generated.

| Item | Excavate | Reuse | Export |
|---|---|---|---|
| Topsoil Strip | 19,230 m3 | | |
| Topsoil Reuse | | 9,615 m3 | |
| Topsoil for Export | | | 9,615 m3 |
| Subsoil from Excavation | 34,385 m3 | | |
| Fill Required | | 25,929 m3 | |
| Subsoil Excess for Export | | | 8,456 m3 |
| Total Surplus for Export off-site | | | 18,071 m3 |

**Table 5.1: Cut and Fill Calculation**

### 5.12 Emergency Planning and Response

A set of standardised emergency response procedures will govern the management of emergency incidents. The contractor will be required to outline emergency incident response procedures in the detailed CEMP and to develop an Emergency Incident Response Plan. These procedures will be as follows:

- Emergency preparedness and response procedure (incl. emergency phone numbers)
- Incident investigation procedure
- Nonconformity, corrective action and preventative action
- Spillage containment procedure
- Pollution prevention programme and corrective action reporting

In the event of spillages or other incidents, steps will be taken to prevent environmental pollution, for example through protection of drains by use of drain covers or booms, use of absorbent granules following a fuel or oil / chemical spill and turning off equipment or other sources of noise or dust.

Once the situation has been rectified, full details the incident and remedial actions undertaken will be provided to the City Council and relevant authorities and recorded appropriately.

Appropriate measures to prevent a recurrence of such incidents will be developed in consultation with these authorities.

### 5.13 Inspections and Monitoring

The environmental performance of the contractor will be monitored through site inspections. Monitoring will be carried out in accordance with the requirements of the EIAR so that construction activities are undertaken in a manner that does not give rise to significant negative effects. Suitable monitoring programmes will need to be developed, implemented, documented, and assessed in accordance with the measures outlined in the detailed CEMP and EIAR.

The results of all environmental monitoring activities will be reviewed by the Site Environmental Manager on an ongoing basis to enable trends to be identified and corrective actions to be implemented as necessary.

Routine inspections of construction activities will be carried out by the Site Environmental Manager on a daily basis to ensure all necessary environmental measures relevant to the construction activities are being effectively implemented by construction staff. Detailed inspections should be carried out weekly which would be appropriately documented by the Environmental Manager. The inspection routine should include:

- Summary of compliance/non-compliance with the detailed CEMP
- Results and interpretation of monitoring programmes
- Key issues noted during inspections
- Summary record of non-conformities, incidents, and corrective actions
- Summary of environmental complaints and queries received in relation to environmental matters; and
- Summary record of environmental training undertaken by staff.

## 6.0 PLANNING POLICY

**Content** **Page**



**Figures, Plates and Tables**

## 6.1 Introduction

This chapter focuses on the key planning policies at national, regional, and local level that guide the nature and extent of the proposed Strategic Housing Development.

This chapter has been prepared by Coakley O'Neill Town Planning Ltd. The lead author is Dave Coakley, Director, Coakley O'Neill Town Planning Ltd, who graduated as a town planner from the University of West England in 2005, and holds the qualifications of BA (Hons), MPhil, MTCP, MIPI, and has worked in the public and private sector in Cork since 2001. Dave has over 20 years professional experience in the field of planning, which has included providing consultancy services in respect of several urban development, infrastructural development, and tourism development including EIA.

## 6.2 Project Description

The proposed development will consist of a strategic housing development of 319no. residential dwellings comprising of 85no. semi-detached units (comprising of 17no. 4-bed units and 68no. 3-bed units), 118no. terraced units (comprising of 8no. 4-bed units, 60no. 3-bed units and 50no. 2-bed units), 53no. duplex units (comprising of 26no. 1-bed units, 25no. 2-bed units and 2no. 3-bed units) and 63no. apartments (in 3no. part 4-storey and part 5-storey blocks and comprising 15no. 1-bed units and 48no. 2-bed units). The development also includes the provision of a crèche facility (519sqm) and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is 33,738.70sqm.

**Figure 6.1. Proposed Development on Aerial View**

## 6.3 Planning Context

The key provisions of national, regional, and local planning policy as they relate to the proposed development are set out in the following sections. The principal guiding international, national, and regional documents are listed below:

- Project Ireland 2040 - National Planning Framework (2018)
- Housing For All (2021)
- Climate Action Plan (2021)
- Urban Development and Building Height Guidelines (2018)
- Sustainable Urban Housing Design Standards for New Apartments, Guidelines for Planning Authorities (2020)
- Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009)
- Design Manual for Urban Roads and Streets (2013)
- Guidelines for Planning Authorities on Childcare Facilities (2001)
- The Planning System and Flood Risk Management (2009)
- The EU Habitats Directive (92/43/EEC) and the EU Birds Directive (79/409/EEC)
- Regional Spatial and Economic Strategy for the Southern Region (2020)
- Cork Metropolitan Area Transport Strategy (2020)
- Cork Metropolitan Cycle Network Plan (2017)
- Cork City Development Plan 2022-2028

### 6.3.1 National Planning Framework, 2018

The National Planning Framework (NPF), which forms part of Project Ireland 2040, is the national level statutory plan guiding land use and sustainable development in Ireland for the next two decades (Department of Housing, Local Government and Heritage, 2020).

The NPF is guided, in part, by the aim of achieving regional parity in the country by significantly growing the population of both the Southern Region and the Northern and Western Region over the next two decades, to counterbalance the dominance of the Greater Dublin Area.

In relation to Cork, the NPF sets a population growth target of at least 50-60% for Cork City and its suburbs by 2040. This is to facilitate Cork becoming a city of scale so that it can become competitive with Dublin, as well as with other comparable European and UK cities of similar scale.

These population growth projections equate to approximately 324,000 people living and working in the city and suburbs and will mean enabling the city to grow by twice as much to 2040 as it has over the past 25 years.

National Strategic Outcome (NSO) 1 "Compact Growth" of the NPF is aimed at consolidating and densifying future urban growth and development within existing settlements and their built-up footprints.

NSO 4 "Sustainable Mobility" is aimed at facilitating a move away from polluting and carbon intensive propulsion systems towards new technologies, as well as facilitating an increase in the patronage of public transport and supporting modal shift towards greater levels of walking and cycling as transport mode choices.

NSO 7 "Enhanced Amenity and Heritage" is focused on enhancing recreational spaces and attractiveness in city and town centres to support a good quality of life. Well-designed public realm, which includes public spaces, parks and streets, and recreational infrastructure are key to achieving this NSO.

NSO 10 "Access to Quality Childcare, Education and Health Services" is prefaced on the fact that good access to a range of quality education and health services is key to creating attractive, successful, and competitive places.

NPF National Policy Objective (NPO) 1a is aimed at ensuring that the projected level of population and employment growth in the Eastern and Midland Regional Assembly area (which contains the Greater Dublin Area) will be at least matched by that of the rest of the country. This NPO is informed by the concept of regional parity, where the targeted growth of the rest of the country up to 2040 should exceed that of the Eastern and Midland Region.

NPO 1b states that the Southern Region of the country is to have an additional 340,000 - 380,000 people, i.e., a population of almost 2 million by 2040. In the context of Cork, NPO 2a translates to a target of half (50%) of future population and employment growth in Cork to be focused in Cork City and its suburbs.

Similarly, NPO 3b means that at least half (50%) of all new homes to be developed in Cork City and suburbs should be delivered within the built-up footprint of the city and its suburbs. This is to be facilitated through the Cork Metropolitan Area Strategic Plan (MASP).

NPO 4 aims to ensure the creation of attractive, liveable, well designed, high quality urban places for diverse, integrated communities, where a high quality of life and well-being can be enjoyed.

NPO 5 dictates that cities and towns should be developed to sufficient scale and quality to be able to compete internationally and to be drivers of national and regional growth, investment, and prosperity.

NPO 6 seeks the regeneration and rejuvenation of cities, towns and villages as environmental assets that can accommodate changing roles and functions, increased residential population and employment activity and enhanced levels of amenity and design quality, in order to sustainably influence and support their surrounding area.

NPO 11 is as follows:

> *In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and generate more jobs and activity within existing cities, towns, and villages, subject to development meeting appropriate planning standards and achieving targeted growth.*

NPO 13 supports the relaxing of certain planning and related standards in urban areas, in particular building height and car parking, to achieve targeted growth, with these features being assessed in the context of well-designed high quality outcomes, with the caveat that public safety is not compromised, and the environment is suitably protected.

NPO 27 is aimed at ensuring the integration of safe and convenient alternatives to the car into the design of communities by prioritising walking and cycling accessibility.

NPO 32 is as follows:

> *To target the delivery of 550,000 additional households by 2040.*

NPO 33 prioritises the provision of new homes at locations that can support sustainable development and at an appropriate scale of provision relative to location.

NPO 35 is aimed at increasing residential density in settlements, through a range of measures including reductions in vacancy, reuse of existing buildings, infill development schemes, area or site-based regeneration and increased building heights.

NPO 64 seeks to improve air quality and reduce pollution in our urban and rural areas through, amongst other measures, integrated land use and spatial planning that prioritise public transport, walking and cycling.

The proposed development aligns with the above NSO's and NPO's of the NPF in that it will:

- contribute to the target of an additional 340,000-380,000 people in the Southern Region (NPO 1b)
- deliver future population growth in Cork City (NPO 2a)
- assist in delivering at least 50% of all new homes within the existing built-up footprint of Cork (NPO 3b)
- assist in creating an attractive, liveable, well-designed, high quality urban place (NPO 4)
- assist in enabling Cork City to compete internationally and to be a driver of national and regional growth (NPO 5)
- encourage more people and generate more activity within Cork City (NPO 11)
- provide a well-designed high quality development in an urban area without compromising public safety or the environment (NPO 13) and
- provide new homes at a location that can support sustainable development, that is of an appropriate scale relative to its location (NPO 33)

As such, the proposed development is fully supported by the NPF.

### 6.3.2 Housing for All, 2021

On 2nd September 2021 the Government launched the latest national housing policy document in the form of "*Housing for All – A new Housing Plan for Ireland*" (HFA). This is the Government's revised policy and investment plan (replacing the 2016 "*Rebuilding Ireland: Action Plan for Housing and Homelessness*") to address the housing crisis which has affected the country since 2014.

With regard to new housing supply, section 3 of the HFA states that over 300,000 new homes are needed by 2030 to address pressure on the housing market. This means 33,000 new homes per annum on average to 2030.

Section 5.6 of the plan emphasises that transport infrastructure and access to public transport are critical enablers of new housing supply, and that if the long term trend of growth in demand for housing and transport is to be met, we must improve land-use and transport planning to meet the NPF strategic objective of achieving compact growth.

It is considered that the subject development, which proposes 319no. residential units contributes directly to Pathways no. 1, 2 and 3 as set out in the policy document. In addition, it is considered that the provision of additional housing in the north environs will also improve the overall rental sector in the North Environs.

63no. units are to be transferred to Cork City Council in order to meet the development's Part V obligations. This will contribute to the core objective of HFA which aims to accelerate social housing, as well as Pathway no. 2 which addresses homelessness, through the delivery of additional social housing stock. It is therefore considered that the proposed development is fully complaint with and supportive of the Action Plan.

This development contributes to Pathway no. 3 as it proposed 319no. houses which will lead to an increase in housing supply. This will then have a positive impact on the affordability of the area as well as the additional social homes which will elevate some issues ongoing across Cork City.

### 6.3.3 Climate Action Plan, 2021

The Climate Action Plan 2021 sets out Government policies that will support the achieving of a 51% reduction in overall greenhouse gas emissions by 2030, enabling Ireland to reach net-zero emissions by 2050, as committed to in the Programme for Government and set out in the Climate Act 2021.

One of the targets of the Climate Action Plan aimed at meeting the required level of emissions reductions by 2030 is to fully implement the NPF.

Specifically, it is the NPF objective for compact growth which the Climate Action Plan refers to as the means by which the spatial planning sector will contribute towards GHG emission reductions. These policies and objectives will ensure that more people will be living within the existing built-up footprint of cities and towns, making much more use of sustainable modes of transport.

Achieving the objectives of the Climate Action Plan will thus be supported through:

- *Reduced travel distances between home, work, and services, which will enable a greater proportion of journeys by bicycle or on foot (zero emissions)*
- *Greater urban density will ensure more viable public transport leading to reduced transport emissions*
- *Higher density residential development, which tends to comprise smaller units and, therefore, require less energy to heat – NPF targets require the proportion of apartments to treble, from 13% in 2019, to 39% by 2030*
- *Closer proximity of multi-storey and terraced buildings, which will require less energy and make renewables-based systems of energy distribution, such as district heating, or area-wide technology upgrades, more feasible*

The proposed development is located in a sustainable suburb of Cork City, identified as a Greenfield Growth Location within the City Development Plan's Core Strategy, with existing and proposed transportation modes that support walking, cycling and use of public transport, thus maximising the potential for sustainable transportation modal choice.

In addition, the proposed development will contribute towards the creation of a more compact urban environment in the suburb of Kilbarry, with reduced car parking provision and enhanced cycle parking provision. The proposed development will have a positive impact on climate action by reason of being a high-density residential scheme that benefits from sustainable connectivity with the city centre and other hubs of employment, social, educational, and recreational importance in the area.

### 6.3.4 Urban Development and Building Height Guidelines, 2018

These Guidelines are premised on there being '*a presumption in favour of buildings of increased height in our town /city cores and in other urban locations with good public transport accessibility*' (para 3.1). They require Local Authorities in their plans to be '*more proactive and more flexible in securing compact urban growth through a combination of both facilitating increased densities and building heights, while also being mindful of the quality of development and balancing amenity and environmental considerations.*' Specifically, SPPR 3A of the Guidelines state that where:

- *an applicant for planning permission sets out how a development proposal complies with a number of criteria [in relation to design, context, visual impact, wind assessment, daylight/sunlight/ overshadowing, etc.), and*
- *the assessment of the planning authority concurs, taking account of the wider strategic and national policy parameters set out in the National Planning Framework and these guidelines,*

*then the planning authority may approve such development, even where specific objectives of the relevant development plan or local area plan may indicate otherwise.*

Therefore, proposals for higher buildings can no longer be ruled out in principle in the City, and, instead, are to be assessed against a number of performance criteria, as follows:

**At the Scale of the Relevant City/Town**

- *The site is well served by public transport with high capacity, frequent service, and good links to other modes of public transport.*

There are a number of bus stops in close proximity to the development. The Upper Kinvara Road stop (ID 244381), the Dublin Hill stop (ID 244391), and the Old Mallow Road stop (ID 255151) are all within a 15-minute walk to the development. Access to the 207, 215, and 248 bus services is provided via these stops.

The 207-bus route which operates 7 days a week and runs a 30min service, serves Donnybrook, Douglas, Ballyvolane, and Cork City Centre. The 215-bus service runs a 30min service and serves Blarney, Cork City Centre, and Mahon Point. This service runs 7 days a week. The 248-bus service operates Monday-Friday service Cork City, Carrignavar, and Glenville.

The Cork Metropolitan Area Transport Strategy 2040 (CMATS) proposes significant improvements to the public transport facilities over and above what is currently available. With the provision of these facilities and other incentives as part of national policy, it is anticipated that a greater shift to public transport will occur during the operational phase of this scheme. CMATS has provided more certainty for the delivery of these enhancements.

One of these improvements is the proposed reopening of the Kilbarry Railway Station, which is c.950m to the south at the opposite end of Dublin Hill.

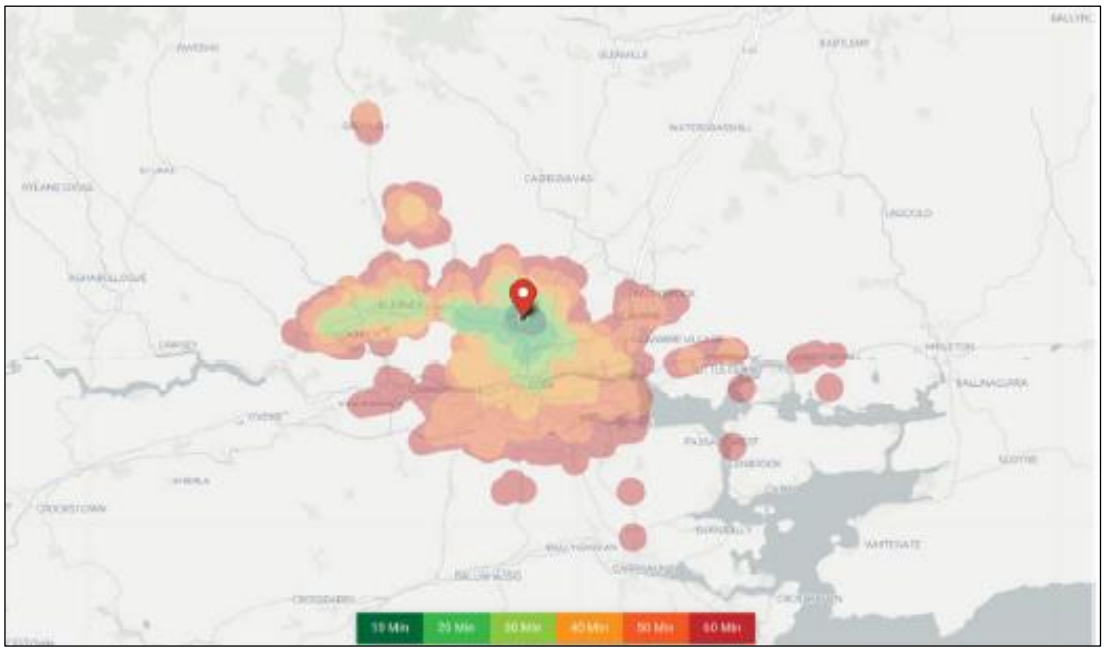

**Figure 6.2: Time of Travel by Public Transport Options**

The aforementioned travel times will significantly improve as a result of CMATS which will introduce high frequency orbital bus services upon completion of the Northern Distributor Road, directly adjacent the subject site. Access to these bus services will be in close proximity to the proposed development.

- *Development proposals incorporating increased building height, including proposals within architecturally sensitive areas, should successfully integrate into/enhance the character and public realm of the area, having regard to topography, its cultural context, setting of key landmarks, protection of key views.*

The Visual Impact Assessment and Design Statement prepared by DMNA Architects/GNet 3D, and included with this application, sets out in detail how the proposed development has evolved during the design process and its potential for impact upon visual amenity. The design of the proposed development has also taken into consideration advice from the Planning Authority regarding the provision of a scheme with a range of heights and dwelling typologies. The height of the apartment blocks is in keeping within the target heights for North Blackpool/Kilbarry set out in the city Development Plan, 2022.

Through the provision of 319no. new residential units, the proposed development will:

- Help deliver economic growth, intensification and regeneration of Cork City and the Metropolitan Area generally;
- Increase density in an area well-served by public transport, infrastructures, and facilities;
- Sensitively respond to the existing townscape, landscape character and setting of the city;
- Effectively contribute to place-making;
- Enhance legibility and local distinctiveness;
- Provide a comprehensive development with quality architectural and urban design of the highest order; and
- Minimise negative impacts on the immediate environment, its residents, and neighbours.

Therefore, the designs and heights set out in the proposed development are justified.

- *Such development proposals shall undertake a landscape and visual assessment, by a suitably qualified practitioner such as a chartered landscape architect.*

The proposed development has been subject to a detailed visual impact assessment which has concluded that the proposed development will have a primarily beneficial impact. Chapter 12 of this EIAR concludes that the large number of neutral effects recorded for the views assessed reflects the capacity of the site and locality to accommodate development of this scale without adversely affecting landscape or visual quality.

Beneficial outcomes associated with the development relate to the delivery distinctiveness, sense of place, quality of materials and finishes and green infrastructure in the form of specimen tree planting along roadways.


**Figure 6.3: Zone of Visual Influence showing the viewpoint locations for the photomontage views**

- *On larger urban redevelopment sites, proposed developments should make a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with sufficient variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape.*

The proposed development will make a positive contribution to place-making by creating a new residential neighbourhood with an associated riverside public park.

**At the Scale of District/ Neighbourhood/ Street**

- *The proposal responds to its overall natural and built environment and makes a positive contribution to the urban neighbourhood and streetscape.*

The proposed development delivers high quality, exemplar modern architectural form at an appropriate scale of development.

- *The proposal is not monolithic and avoids long, uninterrupted walls of building in the form of slab blocks with materials / building fabric well considered.*

The proposed development is of high architectural quality.

- *The proposal enhances the urban design context for public spaces and key thoroughfares and inland waterway/ marine frontage, thereby enabling additional height in development form to be favourably considered in terms of enhancing a sense of scale and enclosure while being in line with the*

*requirements of "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" (2009).*

The proposed development will provide a riverside public park along the Glennamought River, providing a series of walking and cycling routes that pick up on informal routes through the existing site. This area is be connected to other proposals long the river corridor creating a public amenity of regional quality in this part of the city.

A Flood Risk Assessment has been prepared by JB Barry Consulting Engineers and is included in the planning application.

- *The proposal makes a positive contribution to the improvement of legibility through the site or wider urban area within which the development is situated and integrates in a cohesive manner.*

The proposed development will provide a riverside public park along the Glennamought River, providing a series of walking and cycling routes that pick up on informal routes through the existing site. This area is be connected to other proposals long the river corridor creating a public amenity of regional quality in this part of the city.

- *The proposal positively contributes to the mix of uses and/ or building/ dwelling typologies available in the neighbourhood.*

The proposed dwelling incorporates a wide range of house types and sizes, including detached, semi-detached, and terraced dwellings, duplex units and 1 and 2 bed apartments. In addition, a new crèche facility is to be provided with a capacity for 71no. children.

**At the Scale of the Site/Building**

- *The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.*

The proposed development has been designed with adequate fenestration and ventilation for all apartments, therefore maximising views, and access to natural daylight as far as possible. 81% of apartments benefit from dual frontage. The design approach has also ensured that there will be minimal overshadowing.

- *Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'.*

An assessment of the proposed development has been undertaken by BPC Consulting Engineers, undertaken in full compliance with the BRE Guidance. Overall, the results demonstrate that the proposed development is in line with the recommendations of the BRE Guidelines.

**Specific Assessments**

The Guidelines indicate that in order to support proposals at some or all of these scales, specific assessments may be required, and these may include:

- *Specific impact assessment of the micro-climatic effects such as downdraft. Such assessments shall include measures to avoid/ mitigate such micro-climatic effects and, where appropriate, shall include an assessment of the cumulative micro-climatic effects where taller buildings are clustered.*

The proposed development is not of a scale to result in impacts on the micro-climate.

- *In development locations in proximity to sensitive bird and / or bat areas, proposed developments need to consider the potential interaction of the building location, building materials and artificial lighting to impact flight lines and / or collision*.

The proposed development site has been assessed for ecology importance. A habitat associated with the Marsh Fritillary Butterfly has been identified and appropriately addressed in the design approach put forward. Please refer to Chapter 10 *Biodiversity* for further details.

- *An assessment that the proposal allows for the retention of important telecommunication channels, such as microwave links.*

The Design Team's Consulting Engineers have initially indicated that the proposed development will not impact existing telecommunication channels.

- *An assessment that the proposal maintains safe air navigation.*

Consultation with the IAA has not reported any impacts in this regard.

- *An urban design statement including, as appropriate, impact on the historic built environment.*

DMNA Architects have prepared a detailed Architectural Design Assessment, which is included with the planning application, which sets out an analysis of the receiving urban area; the constraints and opportunities presented by the proposed development site; and how the proposed development accords with accepted urban design principles.

Furthermore, the proposed development has been subject to a Cultural Heritage Assessment by John Cronin Associates, which addressed in *Chapter 11* of this EIAR.

- *Relevant environmental assessment requirements, including SEA, EIA, AA, and Ecological Impact Assessment, as appropriate.*

The proposed development has been subject to screening for EIA, and an EIAR has been prepared. Screening for AA indicated that a Stage 2 Natura Impact Assessment is required. A Screening Report for Appropriate Assessment and a Natura Impact Statement are therefore included with the planning application.

### 6.3.5 Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities, 2020

Section 1.21 of the Guidelines states that Specific Planning Policy Requirements (SPPRs) contained in the Guidelines take precedence over any conflicting policies and objectives of development plans.

Section 2.4 of the Guidelines identifies central and/or accessible urban locations as being generally suitable for small-to-large scale and higher density development. The proposed development site, which is located near an existing public bus route which operates at a high frequency during peak times and on a proposed public bus route that will operate at a minimum frequency of every 15 minutes and is within 15 minutes-walk from other public bus routes, can be classified as an accessible urban area.

The proposed development includes 319no. residential units. Having regard to the Guidelines, the proposed development complies with the following SPPRs (as detailed in the Housing Quality Assessment prepared by DMNA Architects):

**SPPR 1**

- 35.3% of the apartments/duplex units are one-bedroom units. This is under the maximum upper limit of 50%.

**SPPR 3**

- All 1-bed apartments meet the minimum required floor area of 45m2
- All 2-bed apartments meet the minimum required floor area of 73m2
- All 3-bed apartments meet the minimum required floor area of 90m2

As the Housing Quality Assessment details, almost 72% of the proposed units exceed the minimum internal floor area standards by 10% and all of the minimum floor areas for private amenity space for the various types of dwellings are met or exceeded.

**SPPR 4**

- 81% of the proposed apartments are dual aspect. This exceeds the minimum requirement of 50% in suburban locations.

The elevation drawings detail the proposed development's compliance with the following SPPR:

**SPPR 5**

- All ground level apartment floor to ceiling heights are a minimum of 2.7m

The plan drawings detail the proposed development's compliance with the following SPPR:

**SPPR 6**

- All apartment buildings comply with the maximum limit of 12 apartments per floor per lift/stair core.

In addition to the above, section 2.6 of the Apartment Guidelines highlight that:

> *Demographic trends indicate that two-thirds of households added to those in Ireland since 1996 comprise 1-2 persons, yet only 21% of dwellings completed in Ireland since then comprise apartments of any type. The 2016 Census also indicates that, if the number of 1-2 person dwellings is compared to the number of 1-2 person households, there is a deficit of approximately 150%, i.e., there are approximately two and half times as many 1-2 person households as there are 1-2 person homes.*

In the context of Cork, apartments represent 19.3% of all household types in Cork City. However, according to Census 2016 data, 97% of all apartments built in Cork City were built before 2010, excluding premises for which the period built was not declared.

Over the last three years (mid-2018-present) 20, 11,716 apartments were built in Ireland but just 360 of them were built in Cork City i.e., just over 3% of the total number of apartments built nationally. Over the same period, 65,230 dwellings were built in Ireland but just 2,362 of them were built in Cork City i.e., 3.6% of the total number of dwellings built nationally. In 2022, with an estimated population of over 5million nationally and 235,643 in Cork City, Cork City will be home to at least 4.7% of the national population.

It is clear from the above figures that Cork, Ireland's second city, is seriously underperforming in respect of the delivery of new housing, and specifically apartments, to serve both its existing population and its projected population growth as envisaged under the NPF. The proposed development is a direct and conscious response to this situation.

### 6.3.6 Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009)

Having regard to these Guidelines, the proposed development is focused on:

- Prioritising walking, cycling and public transport, and minimising car usage;
- Providing easy access for all users and ease of finding one's way around;
- Promoting the efficient use of land and of energy;
- Supporting a mix of land uses to minimise transport demand; and
- Reducing traffic speeds in housing developments.

The proposed development is plan-led in that it will deliver an efficient use of appropriately zoned land and an increased residential population in a new high-density, high-quality, distinctive primarily residential development in Cork City, which is fully supported by national, regional, and local planning policy.

The Guidelines set national residential density targets for particular locations and advise on the calculation of net residential density. On 'Appropriate Locations for Increased Densities', the Guidelines state the following:

> ***(f) Outer Suburban / 'Greenfield' sites***
> ***5.11*** *These may be defined as open lands on the periphery of cities or larger towns whose development will require the provision of new infrastructure, roads, sewers and ancillary social and commercial facilities, schools, shops, employment, and community facilities. Studies have indicated that whilst the land take of the ancillary facilities remains relatively constant, the greatest efficiency in land usage on such lands will be achieved by providing net residential densities in the general range of 35-50 dwellings per hectare and such densities (involving a variety of housing types where possible) should be encouraged generally. Development at net densities less than 30 dwellings per hectare should generally be discouraged in the interests of land efficiency, particularly on sites in excess of 0.5 hectares.*

The site can be considered a greenfield site, as recognised in Figure 2.2 of the City Development Plan. A target of between 35-50 units per hectare is set out for locations such as this, - with which the proposed density of 38.77 units per hectare is fully compliant.

Furthermore, the proposed development is plan-led in that it will deliver an efficient use of appropriately zoned land and an increased residential population in a new high-density, high-quality, distinctive primarily residential development in Cork City, which is fully supported by national, regional, and local planning policy. In accordance with Chapter 4 of the Guidelines, the proposed development will:

- Prioritise public transport, cycling and walking, with a reduced quantum of car parking
- Ensure access for everyone, including people with disabilities (see the accompanying Architectural Design Statement prepared by DMNA Architects);
- Include the correct quality and quantity of public open space (see the accompanying Architectural Design Statement);
- Include measures to ensure satisfactory standards of personal safety and traffic safety within the neighbourhood - the predominance of residential ground floor use means a high degree of passive surveillance throughout the proposed development, both in terms of the public park and the public amenity spaces within the development.
- Present an attractive and well-maintained appearance with high quality material finishes on the facades of the buildings as well as the hard and soft landscaping of the open spaces;
- Promote social integration and provide for a range of household types for different age groups
- Protect, and where possible, enhance the built environment; and
- Provide for appropriate drainage systems.

### 6.3.7 Design Manual for Urban Roads and Streets (2013)

To effectively communicate how the principles, approaches and standards within this Manual have been applied, it is recommended that all proposed developments, regardless of scale, are accompanied by documentation that provides a clear rationale for the project, such as within a design statement.

To ensure that street layout plans communicate a complete picture of the design, it is recommended that the following information be presented, as appropriate:

- The width of streets, footways, verges, medians, and privacy strips.
- The location, type and configuration of crossings and junctions.
- Corner radii (including swept paths).
- On-street parking.
- Horizontal and vertical alignment data.
- Horizontal and vertical deflections.
- Forward visibility splays.
- Kerb lines (including heights).
- Surface Materials and Planting.
- Street furniture and facilities.
- Signage and Line Marking.
- Lighting.

Design teams and planning authorities will need to balance the level of detail given at any stage of the design/consent process. For example, more technical specifications may be better suited to later compliance submissions so that the initial consent process is not overly burdened with detail.

On this basis, a Statement of Compliance with the Design Manual for Urban Roads and Streets has been prepared by the applicants design team.

### 6.3.8 Guidelines for Planning Authorities on Childcare Facilities, 2001

Although Appendix 2 of the Childcare Guidelines for Planning Authorities (2001) states an indicative standard of one childcare facility per 75no. dwellings in new housing areas, this is no longer considered to be a practical benchmark. The 2020 Apartment Guidelines require that childcare facilities be provided in accordance with the demographic profile of the area and the existing capacity of childcare centres. The 2020 Guidelines also specifically state that

> *….one-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and, subject to location, this may also apply, in part or whole, to units with two or more bedrooms*.

Nevertheless, on foot of the conclusions of a Childcare Needs Assessment, a crèche has been provided as part of this application. The needs assessment justifies the provision of a 71no. space crèche as part of the proposed development.

### 6.3.9 The Planning System and Flood Risk Management – Guidelines for Planning Authorities, 2009

There are no historic flood events recorded within the proposed development site according to FloodInfo.ie. The majority proposed development site is located in Flood Zone C. Therefore, the proposed development is not likely to have an impact on floodplain storage and conveyance and will not increase flood risk off site during the construction phase. Notwithstanding, there is a flood zone at the lower level associated with the Glennamought River. Therefore. a Flood Risk Assessment has been prepared and informs this EIAR.

### 6.3.10 EU Birds and Habitats Directives

The network of Natura 2000 sites across the EU is comprised of all designated sites that fall into one of two categories: Special Area of Conservation (SAC) and Special Protection Area (SPA). The protection and conservation of Natura 2000 sites is provided for by means of both the Habitats Directive 92/43/EEC and the Birds Directive 79/409/EEC. Article 6(3) of the Habitats Directive states that:

> *Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

The Habitats Directive has been transposed into Irish law, with the current relevant legislation being the European Communities (Birds and Natural Habitats) Regulations, 2011. Section 42(1) of Part 5 of these regulations states that:

> *A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.*

There is a potential source-pathway link receptor between the Cork Harbour SPA and the proposed development site via the Glennamought River.

A Stage 1 Appropriate Assessment (AA) Screening Report has been carried out to aid the Board in its determination as to whether or not a Stage 2 Appropriate Assessment is required. The AA Screening Report has been submitted as part of the planning application for the proposed development. Based on the nature and extent of the proposed development and the conservation interests of the designated site, a Natura Impact Statement (NIS) has been prepared for the proposed development. The NIS finds that

following an examination, analysis, and evaluation of the relevant information, including in particular the nature of the predicted effects from the proposed development and with the implementation of mitigation measures proposed that the construction and operation of the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.

There is no reasonable scientific doubt in relation to this conclusion.

### 6.3.11 Regional Spatial & Economic Strategy for the Southern Region, 2020

The Southern Regional Assembly was responsible for creating the Regional Spatial and Economic Strategy for the Southern Region (RSES), which came into effect on 31st January 2020. Included in the RSES for the Southern Region is the Cork Metropolitan Area Strategic Plan (MASP).

Regional Planning Objectives (RPOs) 6-10 of the RSES relate to the MASPs for each of the three metropolitan areas of the Southern region – Cork, Limerick- Shannon and Waterford.

- Cork City is the most dominant location for active enterprises in the Southern Region
- With Cork, Limerick and Waterford expected to be amongst the fastest growing cities in the country.
- The plan focuses on growing and strengthening existing metropolitan areas like Cork as an international gateway

Both national and regional policy have assigned a heretofore unprecedented scale and rate of growth for Cork City in order to assist in counterbalancing the excessive growth and sprawl of Dublin. In order to achieve the ambitious regional growth targets set for Cork, it is paramount that proposals such as the subject proposed development of this report are facilitated through the planning process.

RPO 7 of the RSES is as follows:

> *"Delivery and Funding"*
> *It is an objective to: Support sustainable delivery of the Strategic Investment Priorities identified by the NDP for the Cork, Limerick-Shannon and Waterford metropolitan areas and progress co-ordination between the principal stakeholders for delivery to achieve the vision and objectives identified in each MASP.*

RPO 5 sets outs to support the delivery of innovative projects through Urban Regeneration and Development.

RPO 6 seeks to prioritise the delivery of compact growth in cities like Cork.

RPO 8 looks to delivery and active land management approach to development in large metropolitan areas to support compact urban growth.
RPO 157 sets out to target higher development densities in urban areas:

> *"Local Authorities, through appropriate Development Plan policies shall ensure the consolidation of development at higher densities in within existing urban centres, with a focus on locations where it can be demonstrated that such development supports the use of walking, cycling and public transport."*

The RSES outlines the settlement typology for the Region in Table 3.1 of the Plan and Metropolitan areas, such as the north environs where the subject site is located, are identified in the first tier of the typology. It is further noted that a key component of the strategy is to strengthen the settlement structure of the Region, to capitalise on the individual and collective strength of the three cities, metropolitan areas, and strong network of towns. It is considered that the proposed development, which is located within the expanded City boundary, will aid in strengthening the overall settlement structure of the Region.

On this basis, Strategy no. 1 of the RSES is identified as follows:

> *Strengthening and growing our cities and metropolitan areas; harnessing the combined strength of our 3 cities as a counterbalance to the Greater Dublin Area, though quality development, regeneration, and compact growth; building on the strong network of towns and supporting our villages and rural areas.*

The proposed development will deliver 319 no. residential units within the City boundary, therefore increasing the population of the Metropolitan Cork and consequentially helping to achieve Strategy no. 1 of the RSES.

The RSES also include a Metropolitan Area Strategic Plan (MASP) for Cork. Section 7.3 of the Plan identified strategic residential nodes on the Metropolitan rail line, where it is noted that Kilbarry and the Old Whitechurch Road area have opportunities for significant mixed use regeneration and residential and enterprise development providing a northern gateway to the city from the Limerick Road. It is noted that the potential residential yield in this area is 950 no. units.

It is therefore considered that the proposed development, which seeks to provide 319no. residential units on a residentially zoned site in the north environs, is consistent with the RSES and the Cork MASP, and will aid in achieving its aims.

Having regard to the RSES, the proposed development:

- will strengthen the settlement structure of the Region
- will contribute to the achievement of significantly accelerated and urban-focused compact growth (RPO8)
- will respond to the need for quality housing for one and two person households at a sustainable density in the right location (RPO28)
- will make the most efficient use of zoned and serviceable land (RPO31)
- will enhance the vibrancy of the City

The Cork MASP is a constituent part of the RSES and aligns with current national planning policy and objectives, including those contained in the NPF. The proposed development supports the following strategic goals of the Cork MASP:

- Goal 1: Sustainable Place Framework
- Goal 2: Excellent Connectivity and Sustainable Mobility
- Goal 4: High Quality Environment and Quality of Life

The focus of the MASP is to strengthen Cork's role as a metropolitan area, driving economic activity and employment in the city. The overarching principles laid out in section 2.3 of the plan seek to:

- Focus investment to support the revitalisation and reinvigoration of the city centre and promote high density development
- Target growth in the metropolitan area and strategic employment locations along public transports routes
- Promote consolidated growth
- Ensure appropriate employment densities in key areas of the city to activate strategic employment opportunities across the city.

Section 7.3 of the RSES addresses 'Strategic Residential Growth Nodes on the Metropolitan Rail Line'. In relation to North Environs – Kilbarry – Blackpool, identifying a potential yield of 950 residential units, it states:

> *The Blackpool Valley, Kilbarry and the Old Whitechurch Road area have opportunities for significant mixed-use regeneration and residential and enterprise development providing a northern gateway to the city from the Limerick Road.*

According to the CSO, the current average household size in Ireland is 2.75 (Census of Population 2016 - Profile 4 Households and Families). Applying this figure to the 2031 population growth target for Cork City, an additional approximately 27,270 homes will need to be provided in the city by that year. Furthermore, if the realisation of that target number of additional homes is to be consistent with National Policy Objective 3b of the NPF, then at least 13,635 new homes will need to be developed within Cork City and Suburbs within the next decade. This goal requires delivery of residential development in Cork City on an unprecedented scale. The proposed development can be considered as a direct response to this new paradigm for Cork City in that, if granted permission, it would help with the achievement of that target.

Among the Key Transport Objectives (MASP8) is to enhance the Metropolitan Area's rail network. One the actions is the development of a new rail station ***to regenerate and intensify Blackpool/Kilbarry,***

In line with the Cork Metropolitan Area Strategic Plan 2020, the proposed development:

- will strengthen the role of the Cork Metropolitan Area as an international location of scale and the primary driver of population growth in the Southern Region (MASP1)

- will make a significant contribution to the regeneration of the Kilbarry area of the northside city (MASP2)
- will support the case for the reopening of the Blackpool/Kilbarry Rial Station through the provision of new residential populations (MASP8)

### 6.3.12 Cork City Development Plan, 2022

The initial stages of this SHD application were prepared in the context of the subject site being governed and regulated by the policies of both the *Cork County Development Plan, 2014* and *the Cobh Municipal District Local Area Plan, 2017*.[1]

Items 1 and 2 of the Board Opinion makes reference to these documents. However, since this opinion was published, the Cork City Development Plan was adopted on the 27th June 2022[2]. It will come into effect in 6 weeks from this date and will form the basis of the Board's decision on this SHD application.

When published in 2021, the Draft Cork City Development Plan had proposed to continue the current zoning regime for the lands as per the Cobh LAP, 2017, namely:

- An Open Space to the North along the boundary to the river;
- A Residential zoning centrally;
- A Light Industry and Related Uses zoning to the south of the internal road; and
- A small area to the east to be zoned 'sports'

**Figure 6.4. Draft Cork City Development Plan Zoning Proposals (2021)**

A submission was made on behalf of the applicants to the Draft Plan which requested that the lands be zoned to reflect the current development proposal with ZO 1 Sustainable Residential Neighbourhoods

[1] Policy provisions of both Cork County Development Plan, 2014 and Cobh Municipal District Plan, 2017 included as Appendix to this EIAR
[2] Note some of the paragraph, figure and objective numbers cited in this section may change slightly as the final adopted plan was not available at time of preparation.

and ZO 16 Public Open Space zoning objectives. The **Proposed Material Amendments** to the Draft Cork City Development Plan, 2022 proposed the following zoning changes for the subject site:

- **Zoning Amendment 2.54**: From ZO 10 Light Industry & Related Uses to ZO 1 Sustainable Residential Neighbourhoods (south of the internal road, area in blue above)
- **Zoning Amendment 2.55:** From ZO 16 Public Open Space to ZO 1 Sustainable Residential Neighbourhoods (to the north along the boundary to the river, part of area in green above)
- **Zoning Amendment 2.56:** From ZO 17 Sports Grounds & Facilities to ZO 1 Sustainable Residential Neighbourhoods (area to the east, in pale yellow above)

The Council Chief Executive's report recommended that the amendments be adopted without modification, which they were at thew adoption of the Plan.

Having made the Development Plan with these amendments included the zoning of the site therefore now reflects the site layout of the residential development proposal, which is the subject of this application.

The site has two zoning objectives.

- **ZO 1 Sustainable Residential Neighbourhoods** – relating to the lands located at the central and southern side of the site, where the objective is:

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

  Section ZO 1.1 notes that the provision and protection of residential uses and residential amenity is a central objective of this zoning. Section ZO 1.2 states that development in this zone should generally respect the character and scale of the neighbourhood in which it is situated. Development that does not support the primary objective of this zone will be resisted. Section ZO 1.3 outlines the primary uses in this zone and include residential uses, crèches, schools, home-based economic activity, open space, and places of public worship

- **ZO 15 Public Open Space** – relating to the lands at the northern side of the site which are proposed to be developed as a riverside park, where the objective is to protect, retain and provide for passive and active recreational uses, open space, green networks, natural areas, and amenity facilities.

  Section ZO 15.1 states that the primary purpose of this zone is to preserve all land in this zone for open space and amenity use. Section ZO 15.2 advises that there is a presumption against developing land zoned Public Open Space for alternative purposes.

A small area at the Delaneys GAA car park is zoned for sports use while the access road to Dublin Hill is zoned residential. The proposed development site is also designated as a Tier 2 site, as per Figure 2.21 of the Plan. Section 12.13 of the Plan explains that Tier 2 lands are serviceable zoned lands that are not currently fully serviced but have the potential to become fully serviced within the life of the Plan.

Paragraph 2.19 of the Plan addresses population growth in the City, stating:

> *The NPF targets 60% population growth for Cork City by 2040. This will result in an additional 125,000 people living in the City within 20 years. A breakdown of shows how the City will need to achieve 10% - 17% population growth within each of the next four census periods.*
> *Over the last 30 years, Cork City has grown at a lower rate of 2% - 5%. Significant planning and investment will be required over a sustained period to achieve the NPF growth target by 2040.*
> *A breakdown of this shows how the City will need to achieve 10% - 17% population growth within each of the next four census periods.*

Figure 2.6 of the Plan sets out city population targets to 2040.

| | 1991 | 1996 | 2002 | 2006 | 2011 | 2016 | 2022 | 2028 | 2031 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cork City* | 178,716 | 184,502 | 191,277 | 195,478 | 200,373 | 210,853 | 235,643 | 260,433 | 286,178 | 335,853 |
| %Change | – | 3.2% | 3.7% | 2.2% | 2.5% | 5.2% | 11.8% | 10.5% | 9.9% | 17.4% |

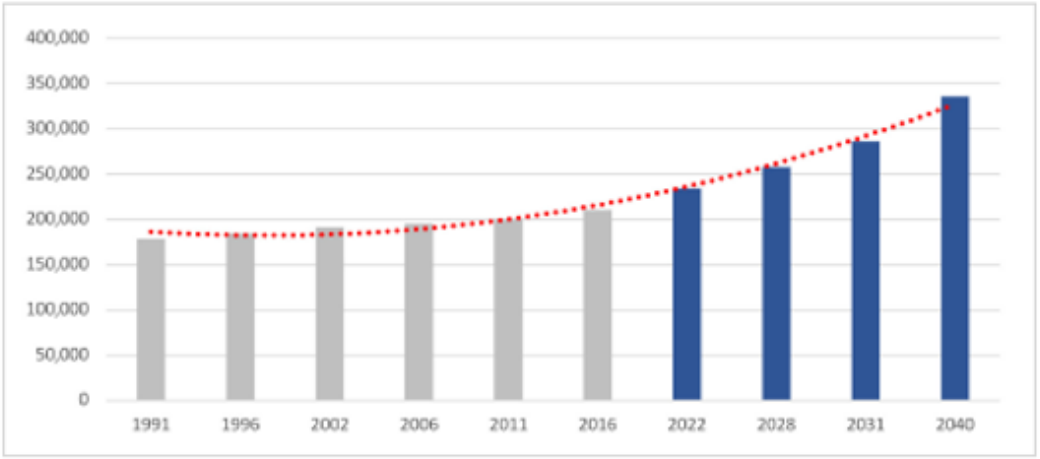


**Figure 2.6:** Population Trends and Targets, 1991-2040 (*Best estimates based on current boundary)

**Figure 6.5: Population Targets - Figure 2.6 of Cork City Development Plan**

Figure 2.8 of the Plan illustrates the City Concept Plan to 2040 highlighting the subject site as part of a 'City Regeneration and Expansion Area'

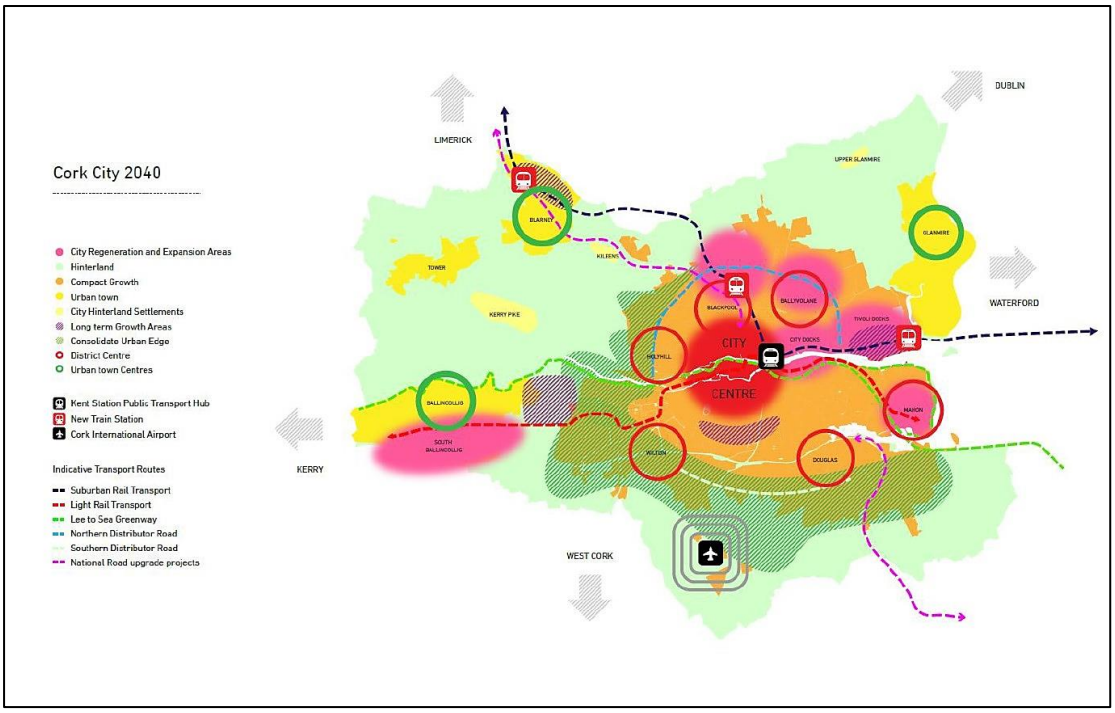


**Figure 6.6: City Concept Plan - Figure 2.8 of Cork City Development Plan**

Figure 2.10 illustrates the City's Liveable Walkable Neighbourhoods, Communities and Urban Towns, identifying the subject lands are part of the North Blackpool/Kilbarry area of the North East Suburban Area

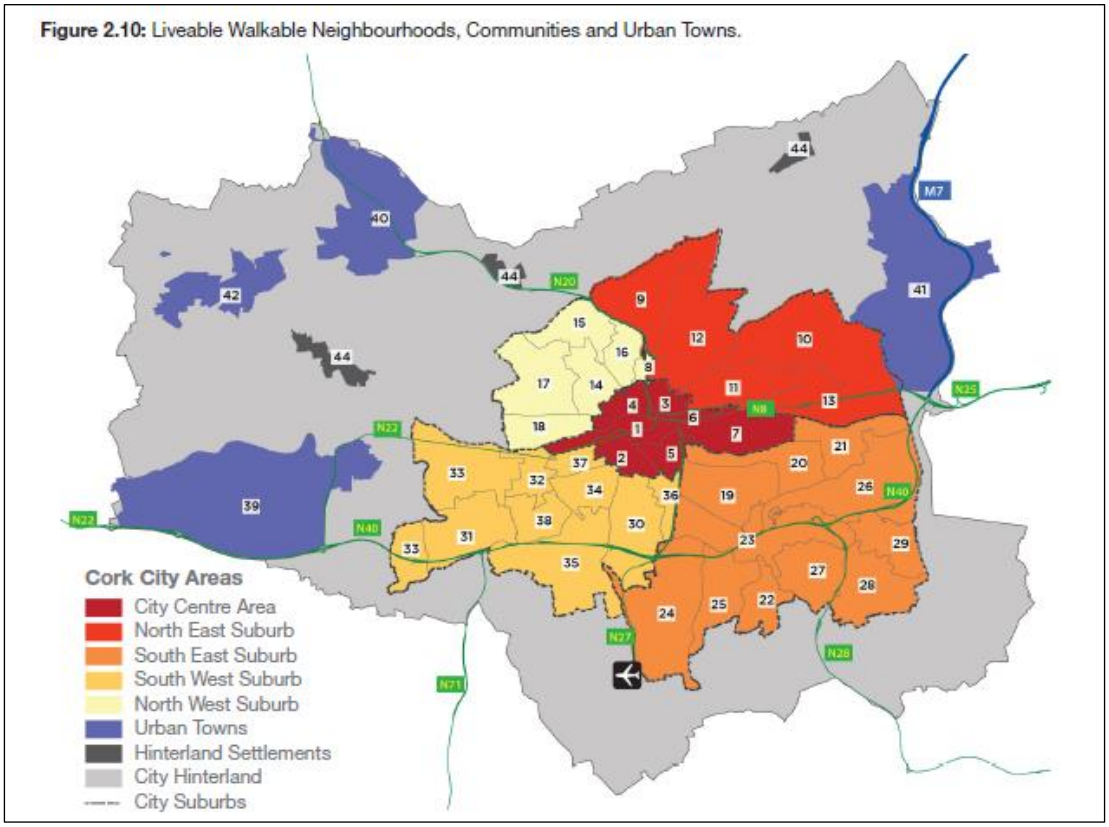


**Figure 6.7: Walkable Neighbourhoods - Figure 2.10 of Cork City Development Plan**

Paragraphs 2.47 and 2,.48 address the Plan's Core Strategy, stating:

> ***2.47*** *The Core Strategy Table (Table 2.2) distributes the NPF population targets within the city. These targets are set against the current population of an area (Census 2016) showing proportionate levels of growth being planned for at a local level. The table sets out a range of different targets including major growth for City Docklands, the strategic expansion of areas such as Ballincollig, Glanmire and Blarney and the consolidation of the City Centre, the City Suburbs and Tower.*
>
> ***2.48*** *The Core Strategy provides certainty on the location of all lands zoned needed to achieve NPF growth targets within the city up to 2028. By breaking these targets down to site specific locations, the strategy directly links to the zoning objectives set out in Chapter 12 Land Use Zoning Objectives. This approach allows all stakeholders to concentrate on more detailed planning required to deliver housing, service and transport infrastructure, neighbourhood amenities, urban design and place making at a local level. It also allows Cork City Council to carry out other active land management measures necessary to help realise the ambitious growth targets set out for the City.*

This Strategy is illustrated in Figure 2.20, where the site is part of a 'City Regeneration and Expansion Area'

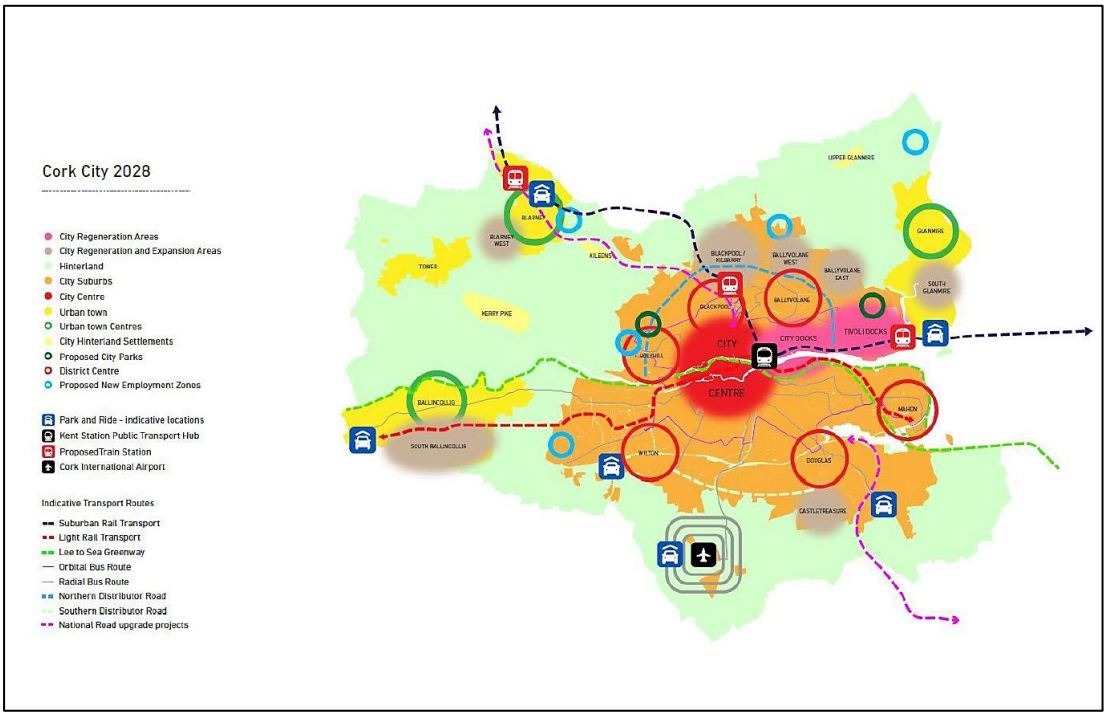


**Figure 6.8: Core Strategy - Figure 2.20 of Cork City Development Plan**

This is reflected in Table 2.3 which sets out the City Growth Strategy for 2022 – 2028 in quantitative terms. Figure 2.2 identifies Built Up Footprint and Greenfield Growth Target Locations for the period of the Plan between 2022-2028. The subject site is identified as a Greenfield Growth Location.

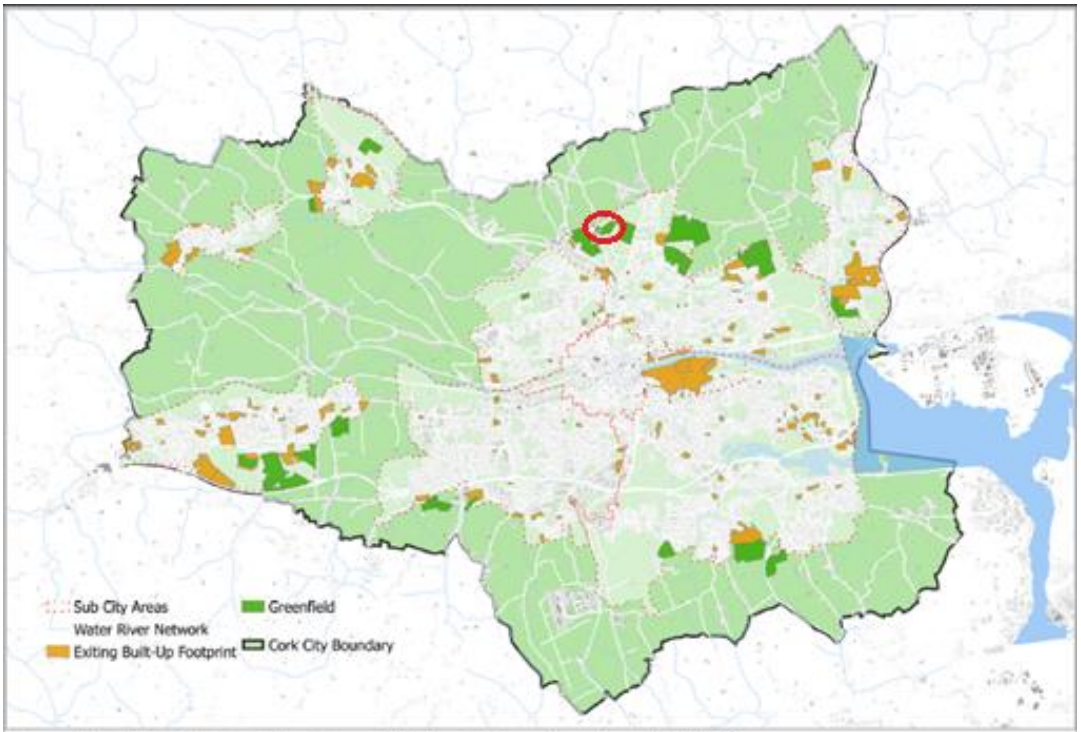


**Figure 6.9: Growth Locations – (Site in Red) Figure 2.22 of Cork City Development Plan[3]**

A summary of the key objectives for city growth follows in Table 2.6 setting out the roles, key sites, and key deliverables the Core Strategy will play in shaping land use planning in Cork City during this Plan period as it relates to the city suburbs area, where the subject site is located, it is as follows:

| *City Area* | *Role in Core Strategy* | *Some Key Sites* | *Key Deliverables* |
|---|---|---|---|
| *City Suburbs* | *Consolidate and enhance by providing a mix of new neighbourhood uses in suitable underutilised locations. Prioritise walking, cycling and public transport access. Deliver uses, layouts and densities that enhance existing local character. Deliver high quality sustainable transport orientated development in combination with high frequency bus routes, the new commuter station at Blackpool (Kilbarry) and prioritised cycling and walking routes set out in CMATS.* | *Ballyvolane, Mahon Blackpool / Kilbarry, North-West Quarter Regeneration area, Old Whitechurch Road. Regenerate underutilised sites in existing neighbourhoods including Mayfield, Douglas, Grange, Togher, and Wilton.* | *1. Delivery of CMATS*<br>*2. Framework plans for Blackpool / Kilbarry, Ballyvolane, and Douglas.*<br>*3. Action plans for Neighbour- hood Development Sites.*<br>*4. New City Parks in the Northeast and Northwest suburbs.* |

**Table 6.1: Growth Strategy - Suburban Areas – Cork City Development Plan**

Strategic Objective 1 of the Plan is to create a compact liveable growth, as follows:

> *To increase the population of Cork City in line with national and regional growth targets. To develop Cork City as an international compact, sustainable healthy city of scale and the regional driver of growth by creating sustainable, liveable, integrated communities and neighbourhoods for all. To plan to deliver at least half (50%) of all new homes in the existing built-up footprint of the City.*

[3] **NOTE:** This is not the final figure. Figure 2.22 was proposed to be amended to reflect a more accurate alignment of the built up edge of Cork City, map to be published pending rezoning alignments as part of plan finalisation (no proposed amended image available).

Objective 2.18 relates to Underutilised Sites such as the subject site, stating:

> *Cork City Council will seek to address issues of dereliction, vacancy, and underutilisation of sites within Cork City by encouraging and facilitating their re-use and regeneration subject to good planning and the infrastructural carrying capacities of the area.*

With reference to Paragraph 11.38 of the Plan, the subject site is location within the Inner Urban Suburb of North Blackpool, described as follows:

> *8. North Blackpool: The northern extension of the N20 corridor beyond Blackpool encompassing the industrial area north of the centre and the residential areas on the western side of the N20.*

Housing Supply Targets are set out in Table 3.2 and sets out a target of 16,236 new homes in the City between 2022 and 2028. This is supported by Objective 3.3 relating to New Housing Supply. The development of zoned land forms part of the strategy set out to achieve the supply targets.

Residential density is addressed in Chapter 3. Paragraph 3.24 states:

> *Greenfield sites will need to be developed to densities that reflect their suitability for urban density. This will require a step-change in the urban density of schemes being proposed. As a general rule the minimum density shall be 35 dwellings per hectare (net density), excluding one-off houses.*

Objective 3.5 Residential Density refers:

> *Cork City Council will seek to:*
> *a. Promote compact urban growth by encouraging higher densities throughout Cork City according to the Cork City Density Strategy, Building Height and Tall Building Study and resultant standards set out in Chapter 11: Placemaking and Managing Development and Mapped Objectives; and*
> *b. Ensure that urban density is achieved by development proposals providing for high quality sustainable residential development, ensure a balance between the protection of the established character of the surrounding area and existing residential amenities;*
> *c. Ensure that urban density is closely linked to creating successful neighbourhoods (see 3-A-1, above) and ensuring that neighbourhoods are integrated and permeable to ensure short trips are possible to urban centres, local services and amenities;*
> *d. Ensuring high-quality architectural, urban and public realm design. Guidance is set out in Chapter 11: Placemaking and Managing Development.*

Strategic Objective 2 relating to Delivering Homes & Sustainable Neighbourhoods underpins this objective:

> *To increase the population of Cork City in line with the Core Strategy. To deliver sustainable, liveable, integrated, safe, healthy and child friendly communities and neighbourhoods. To ensure that new homes are provided at appropriate densities in brownfield, infill and greenfield locations within and contiguous to existing City footprint identified in the Core Strategy, and aligned with*

*transport, community and social infrastructure. To ensure that new homes are provided with a good mix of accommodation types and sizes to meet the needs and abilities of all members of society.*
*To achieve a higher quality of life for Cork City's communities, promoting healthy living, wellbeing and active lifestyles. To ensure that placemaking is at the heart of all development to create attractive, accessible, liveable, well-designed, child-friendly, playful, healthy, safe, secure and welcoming, high-quality urban places. To promote the concept of a 15-minute city focused on inclusive, diverse and integrated neighbourhoods served by a range of homes, amenities, services, jobs and active and public transport alternatives.*
*Proposals for new development will demonstrate how placemaking is at the heart of the development and how the development will contribute to the local neighbourhood.*

Objective 3.6 "Housing Mix" is as follows:

*"Cork City Council will seek to:*
*a. Implement the provisions of the Joint Housing Strategy and HNDA as far as they relate to Cork City;*
*b. Encourage the development of an appropriate mix of dwelling types to meet target residential densities, utilising a range of dwelling types and density typologies informed by best practice (as illustrated in "Density Done Well" in the Cork City Density Strategy, Building Height, and Tall Building Strategy) with combinations of houses, stacked units and apartments;*
*c. Within all new residential developments it will be necessary to ensure an appropriate balance of housing tenure and dwelling size to sustain balanced and inclusive communities, including a balance of family-sized units and smaller dwellings tailored to suit the location (please refer to Chapter 11: Placemaking and Managing Development for those standards);*
*d. Deliver at least 20% below-market priced housing across Cork City and ideally within each new residential neighbourhood;*
*e. Encourage the provision of housing for one and two person households in all neighbourhoods to meet the needs of all age groups, including providing for downsizing to release family housing units;*
*f. Update Development Plan policy as necessary to reflect emerging national guidance with regard to housing standards."*

Objective 3.21 "Childcare Facilities" states:

*To support the provision and expansion of high-quality childcare facilities throughout the city. The Council will:*
*a. Require purpose built childcare facilities as part of proposals for new residential developments of more than 75 dwelling units. However, where it can be clearly established that existing facilities are sufficient, alternative arrangements will be considered.*
*b. Consult with the Cork City Childcare Company and the HSE on planning applications where childcare facilities are proposed.*
*c. Require employers with more than 500 members of staff to provide childcare facilities as part of planning applications for significant new and extended development.*

This objective is supported by Paragraphs 11.162 and 11.163.

In relation to the Northern Distributor Road, which is to run to the immediate north of the subject site, the following is stated:

> *4.118 CMATS identifies the need for additional road network infrastructure on the north side of Cork City to cater for access to planned development lands, provide walking and cycling linkages, access to radial public transport routes, orbital public transport provision, and the removal of some strategic traffic from Cork City Centre.*
>
> *4.119 This new road will be in the form of a distributor road referred to as the Cork Northern Distributor Road (CNDR). This is distinct to the Cork North Ring Road (N40 north), outlined below in this Chapter, which will be examined by Transport Infrastructure Ireland.*
>
> *4.120 The Cork Northern Distributor Road is a short-term objective and considered to be a 'critical enabler' for CMATS as it:*
> - *Creates opportunities for sustainable development of existing land banks in the North City Cork Metropolitan area including the Ballyvolane Urban Expansion Area.*
> - *Facilitates the rollout of sustainable transport measures including public transport services for the North City area.*
> - *Facilitates the introduction of a HGV ban within the City Centre;*
> - *Serves the requirements of local traffic demand in the northern CMA; and*
> - *Allows for the downgrading of national routes entering Cork City, which can therefore allow for the prioritisation of sustainable modes on these routes.*
>
> *4.121 The Cork Northern Distributor Road will provide an orbital route for bus, pedestrian, cycle and some strategic and general traffic and will reduce reliance on radial routes through the City Centre. CMATS proposes that the NDR would provide connectivity at its western end to join the existing N22.*

The site is located in the Blackpool Kilbarry Expansion Area. the following objectives for this area are set out.

> *Objective 10.75 Blackpool Kilbarry Expansion Area*
> *To support the compact growth and development of Blackpool/Kilbarry Expansion Area as a strategic City expansion area, as identified in the Core Strategy. All development shall be designed, planned and delivered in a co-ordinated and phased manner, using a layout and mix of uses that form part of an emerging neighbourhood integrated with the wider area.*
>
> *Objective 10.76 Blackpool / Kilbarry Framework Plan*
> *Cork City Council will produce a Framework Plan for the development of the Blackpool / Kilbarry area. The coordinated provision of services, infrastructure, mix of land uses, transport and mobility, quality urban design and development will form part of the overall framework.*
>
> *Objective 10.77 Blackpool Neighbourhood Centre Regeneration Plan*

*Cork City Council will produce a Plan for the regeneration of the Blackpool Neighbourhood Centre. The coordinated provision of services, infrastructure, mix of land uses, transport and mobility, quality urban design and public realm development will form part of the overall framework.*

*Objective 10.78 Blackpool / Kilbarry Development Objectives*
*a. To create a high quality, vibrant, distinct and accessible mixed-use urban centre in Blackpool, serving as an attractive northern gateway to the City and a desirable destination for northside suburban communities, encompassing a mix of retail, employment, residential, community and recreational uses.*
*b. To facilitate the development of an integrated public transport interchange centred on the creation of a new commuter rail service and connecting bus services. To encourage and support sustainable residential and employment development in the Kilbarry area along with upgrades in public transport and roads infrastructure.*
*c. To respect and enhance the built heritage and architectural character of the area, through the creation of a high quality public realm and high standards of building design.*
*d. To preserve and enhance the sensitive and distinct landscape, visual character and biodiversity of the area and in turn provide for recreational uses, open space and amenity facilities.*

Chapter 11 address residential development and housing standards. The following have relevance.

Paragraph 11.31 advises:

*An understanding of the character of an area is essential to inform strategies for the development of sites and areas. The Cork City Urban Density, Building Height and Tall Building Study 2021 sets out an assessment of prevailing height based upon an analysis of building heights in Cork City's 44 neighbourhoods.*

In terms of Residential Density, the following paragraphs are set out:

*11.69 Density is a measure of the relationship between buildings and their surrounding public and private space. The Cork City Urban Density, Building Height and Tall Buildings Study provides the basis for the densities set out below in this Development Plan.*

*11.70 The most appropriate measure of residential density will be in the form of dwellings per hectare (DPH) for residential or predominantly residential developments. Plot ratio is most useful in establishing development capacity and in relation to mixed use schemes that are predominantly non-residential in nature.*

*11.71 Most of Cork City has been designed around the use of the private car and is built at densities of less than 25 dwellings per hectare in traditional suburban formats, with one particular model of dwelling type, gardens, amenity space and parking. Developing Cork City as a compact city will require the city to be built at higher densities utilising different models of development. Most of the new development in Cork City and the Urban Towns will be built at a "gentle density" of 40-70dph and a scale of 2-4 storeys. Some areas will be developed at densities higher than this (e.g. the City*

*Centre, City Docks, Tivoli Docks, the inner city areas, Blackpool and the light rail corridor at Wilton and Mahon).*

Quantitative Standards for all Residential Development are as follows.

Residential densities are set out in Table 11.2. Densities are expressed in terms of minimums and maximums for the constituent areas of the City. The target density north Blackpool of between 40 and 100.

*Residential Mix*
*11.74 Development proposals will need to ensure that they have an appropriate residential mix in terms of dwelling type, dwelling size, tenure, and specialist housing.*

Paragraph 11.76 states:

*All developments will need to comply with dwelling size mix set out in Tables 11.3 -11.9.*

Dwelling size mix targets have been identified for four different market types, one of which is the suburban areas where the subject site is located.

Table 11.8 "City Suburbs Dwelling Size Mix for Housing Developments" of the Cork City Development Plan 2022-2028 presents the dwelling size mix for housing developments in the city suburbs and is as follows:

| Unit | Min | Max | Target |
|---|---|---|---|
| **Studios / PBSA** | **0%** | **15%** | **10%** |
| **1 bedroom** | **15%** | **25%** | **20%** |
| **2 bedroom** | **25%** | **40%** | **34%** |
| **3 bedroom** | **18%** | **38%** | **28%** |
| **4 bedroom / Larger** | **5%** | **15%** | **8%** |

**Table 6.2: Dwelling Mix Targets -Table 11.8 of Cork City Development Plan**

Objective 11.2 "Dwelling Size Mix" of the Cork City Development Plan is as follows:

*"All planning applications for residential developments or mixed-use developments comprising more than 50 dwellings will be required to comply with the target dwelling size mix specified in Tables 11.3-11.9, apart from in exceptional circumstances.*
*Applications for 10-50 dwellings will need to provide a dwelling size mix that benefits from the flexibility provided by the dwelling size target ranges provided for the respective sub-area.*
*Purpose-Built Student Accommodation schemes will be exempt from dwelling size mix targets. Where there is a target for student accommodation, and it can be demonstrated that this demand has been provided for within the area, then this demand can be reassigned to other dwelling sizes according to the relative target proportions.*
*Where a clear justification can be provided on the basis of market evidence that demand / need for a specific dwelling size is lower than the target then flexibility will be provided according to the ranges specified."*

Paragraph 11.91 addresses apartment standards and advises they are to be aligned with the Government guidance in the form of Sustainable Urban Housing: Design Standards for New Apartments.

Paragraph 11.112 addresses 'Public Open Space in Housing Developments' advising that public open space for residential developments will normally be required as per Table 11.11 apart from in exceptional circumstances. This table sets out a general provision of 10%, while at Greenfield sites / Areas for which a local area plan is appropriate it is 15%. Objective 11.5 addresses Private Amenity Space for Houses, outlining a general requirement for 48sqm, while acknowledging that smaller areas may be provided.

Paragraph 11.115 deals with 'Phased Development', stating that all large development proposals should be accompanied by a phasing schedule, which may be subject to planning condition to ensure compliance

The subject site is located in car parking zone 2 which Paragraph 11.234 advises reflects areas that are or will be accessible to mass transit on the form of Light Rail Transit or BusConnects and encompasses most the city suburbs.

Maximum standards are set out in Table 11.3. for residential development 1 and 2 bed units should provide a maximum of 1 car parking space while 3 and 3+ bed units should provide 2 spaces. Creches should provide 1 space per 6 children. Table 11.4 sets out bicycle parking requirements noting 0.5 spaces per unit for apartment developments in suburban areas and 1 per 25 children for creche uses.
Chapter 12 address land use zonings. In relation to the purpose of the zoning objectives set out, the following is stated:

> *12.1Land use zonings spatially represent the development strategy for the City. The development strategy for Cork City is set out in the Core Strategy. The land use zoning strategy is based on the principles of compact growth, sustainable communities and neighbourhoods, placemaking and climate resilience, and the Strategic Vision for Cork City set out in Chapter 1.*
>
> *12.2 There are twenty one land use zones in this Plan, each with its own distinct objective to facilitate a particular type(s) of development. These zones indicate where different types of development are appropriate within the City and are indicated on the Zoning Maps.*
>
> *12.3 Zoning objectives only relate to land use. A range of other factors including density, height, mobility, design and environmental criteria, amongst others, determine whether or not any particular development proposal is appropriate in an area. Zoning objectives cannot be considered in isolation and must be read in association with all Development Plan objectives set out in this Plan. If in doubt, the direction provided in the Core Strategy should be followed.*

Overall, the proposed development aligns with the Plan objectives in the following ways:

- Will comply with the Z0 1 Sustainable Residential Neighbourhoods zoning objective for the site.
- Will contribute towards achieving NPF population growth targets and the objective of compact growth.

- Will deliver much needed new homes in Cork City, that will strengthen, expand, and diversify the existing community in the area.
- Will support a high degree of sustainable transport use.
- Will support national and local climate action objectives regarding renewable energy generation, passive solar heating and a high standard of build quality including insulation.
- Will provide excellent open space with active recreational infrastructure for all age groups, while at the same time enhancing biodiversity on site through the use of SUDS and through the planting of new native and high value non-native trees and other plant species in line with the All-Ireland Pollinator Plan.
- Will exhibit an example of best-in-class placemaking, with high-quality urban design.
- Will support the objectives of the Cork MASP.
- Aligns with the objectives of CMATS, particularly in terms of the opening of the Blackpool/Kilbarry Rail Station, BusConnects and walking and cycling routes and infrastructure, including the propsoed Northern Distributor Road.
- Will contribute to the realisation of a 15-minute neighbourhood in the Kilbarry area that is walkable and permeable, with a high degree of passive surveillance designed into the scheme.
- Through its design, will ensure a high quality of life for those living on site and nearby.
- Will provide a good choice of dwelling types and sizes. This, combined with the high-quality urban design will support a sense of inclusive, diverse community forming on site.
- Has the potential to instigate the wider regeneration of the Kilbarry area of the northside.
- Provides for EV parking and will facilitate a high degree of cycling.
- Is supported by a Daylight and Sunlight and Overshadowing assessment which demonstrates that the proposed development will ensure high levels of access to daylight and sunlight for future residents, without excessively overshadowing neighbouring properties.

The proposed development also clearly aligns with and supports the following key strategic principles of the Strategic Vision of the Plan:

- Compact growth
- A city of neighbourhoods and communities
- Sustainable and active travel
- A resilient city
- A healthy, inclusive, and diverse city
- A connected city

Section 4 "Building Heights Analysis" of the Cork City Urban Density, Building Height and Tall Building Study, a constituent part of the Cork City Development Plan, sets out a methodological approach designed to determine areas considered to be most suitable for taller buildings.

In acknowledging that a tension exists between physical characteristics and policy framework, Section 3 of the study states that the building height and density strategy prepared for Cork City has been developed and arrived at:

> *in the knowledge that some informed judgements will also need to be made to reflect on local circumstances when considering suitability for different forms of development and proposed densities on a case by case basis.*

The site is located within the North Blackpool/Kilbarry Inner Suburban Area where building heights are targeted to be between 3 and 5 stories. The proposed development complies with this requirement.

Section 2.41 of the Plan acknowledges that average household size will continue to decrease over the lifetime of the Plan, and states that the Joint Cork Housing Strategy and Housing Need Demand Assessment strategy (HNDA), "*sets out a city-wide average household size target of 2.49 for the Plan period based on a changing average household size from 2022-2028*." Table 11.8 presents the dwelling size mix for housing developments in the city suburbs.

The proposed number of 3-bed units marginally exceeds the maximum set out in the Development Plan. In all other respects, it complies. The percentage exceedance of 2.75% equates to a 8 to 9 residential units. In the context of the overall scheme and the scale and extent of development in the immediate area and across the northside of the city, this exceedance is not considered material or significant. However, on the basis that a material contravention of the City Development Plan may occur, a material contravention statement has been prepared.

Table 11.11 of the Plan states that the general provision for public open space for the proposed development is 10%. The proposed development provides for more than double this amount, with 23% of the site designed as public open space.

Para 11.115 requires all large development proposals to be accompanied by a phasing schedule, while para 11.116 of the Plan states the following:

> *Developments over 100 residential units shall demonstrate that adequate provisions for specified physical and social infrastructural requirements, including roads, sewers, water mains, community, recreational and sporting facilities (indoor and outdoor), public transport, first and second level schools and shops are available at completion to support the development.*

A Phasing Plan has been prepared and is submitted with the application. As detailed in the Construction and Environmental Management Plan (CEMP) prepared by JB Barry Consulting Engineers, copies of which accompany this planning application, following an initial site development works phase of approx. 2-4 months in duration, the proposed development will be constructed over 3 no. phases. These phases are detailed in the CEMP as well as the EIAR.

In addition, a Social and Community Audit (SCA) has been prepared by Coakley O'Neill Town Planning, copies of which accompany the planning application. The SCA demonstrates that, with the exception of childcare for pre-school children, adequate social infrastructure is/ will be available in the area to serve the proposed development.

Para 11.224 of the Plan stipulates that the layout of proposed new residential developments must be designed in accordance with the Design Manual for Urban Roads and Streets (DMURS). As outlined above in Section 6.14 of this report, a DMURS Compliance Statement has been prepared in respect of the proposed development.

According to para 11.234 of the Plan, the site of the proposed development is located in Zone 2. A total of 534no. car parking spaces are proposed, along with 124no. bicycle spaces and 12 motorbike spaces.

Para 11.224 of the Plan stipulates that the layout of proposed new residential developments must be designed in accordance with the Design Manual for Urban Roads and Streets (DMURS). As outlined above, a DMURS Compliance Statement has been prepared in respect of the proposed development.

### 6.4 Conclusion

In conclusion, having regard to:

- the provisions of the National Planning Framework, which support the escalation of population growth in the existing built-up area of Cork City,
- the provisions of the Regional Spatial and Economic Strategy for the Southern Region, which recognises the need to densify Cork City,
- the Design Manual for Urban Roads and Streets 2019,
- the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas, and the accompanying Urban Design Manual – A Best Practice Guide 2009,
- the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2020,
- the site's strategic position adjacent other large residential redevelopment sites on the northside the city,
- the site's location within the 'North Blackpool/ Kilbarry - City Regeneration and Expansion Area' and its identification as a 'Greenfield Growth Target Location',
- the site's proximity to public transport, and the proposals for significant public transport upgrades in the immediate area, including the reopening of the Blackpool/Kilbarry Rail Station and the construction of the orbital Northern Distributor Road,
- the significant potential of the proposed development, owing to its scale and nature, to initiate regeneration in the Kilbarry area along with City Council proposals at Old Whitechurch Road and LDA proposals on former IDA lands at Dublin Hill,
- the nature, scale, and design of the proposed development, and
- the pattern of existing, permitted, and proposed development in the area,

It is considered that the proposed development would not seriously injure the residential or visual amenities of the area or of property in the vicinity, would respect and enhance the existing character of the area and would be acceptable in terms of pedestrian and traffic safety and convenience. The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

## 6.5 References

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## 7.0 TRAFFIC AND TRANSPORTATION

**Content** **Page**



**Figures, Plates and Tables**

## 7.1 Introduction

### 7.1.1 Chapter Author

This Chapter has been prepared by Ken Manley, BE CEng, MIEI, RConsEI HDip Envm Eng. Ken is a company director and founding member of MHL and Associates Ltd. He is a member of the Institute of Engineers Ireland (IEI) and the Association of Consulting Engineers of Ireland (ACEI).

### 7.1.2 Chapter Context

The structure of this Chapter is in accordance with the European Commission EIAR Guidance and draft EPA EIAR Guidelines (both 2017) and TII Document, Traffic and Transport Assessment Guidelines, 2014 and is developed using data from independently commissioned traffic counts at key junctions/locations, and local data extracted from the 2016 National Census.

### 7.1.3 Methodology

**Guidance**

A Traffic and Transportation Assessment (TTA) has been prepared in accordance with the NRA's 2014 publication "Traffic and Transport Assessment Guidelines" and the "Guidelines for Traffic Impact Assessments" as published by the Institution of Highways & Transportation U.K. in 1994. The purpose of a TTA is to assess the potential traffic impact of a development on the existing road network and propose any necessary mitigation measures to best accommodate the expected traffic volumes generated by the proposed development. It is also a requirement to ensure that proposals promote more efficient use of investment in transportation infrastructure, reduce travel demand and promote road-safety. Site Investigation

Key parameters relating to the traffic modelling carried out included: junctions to be assessed, trip generation, modal shift targets, trip distribution, and assessment years.

**Assessment methodology**

The aim of this TTA is to identify the characteristics of the site of the proposed development and surrounding area, examine the likely transport implications, ensure sustainable accessibility is maximised and appropriate infrastructure provided to accommodate the proposed development.

The key issues that are addressed in the TTA, with reference to the size and location of the development proposal, are as follows:

- Review of the site location, composition, and local roads network.
- Analysis of Road Safety data.
- A review of the relevant planning and transport policy.
- Description of the development proposal.
- Forecast trip generation.
- The use of appropriate and agreed traffic modelling software for the assessment of individual junctions.
- Provide With/Without Development assessment for each of the critical junctions.
- Assess significance of development generated traffic upon the surrounding transport infrastructure and identify any necessary mitigation.

The opening year is the year of expected completion of the scheme (319 units) including the creche and is taken to be 2025. In accordance with the NRA's "Traffic and Transport Assessment Guidelines", a traffic analysis is required to be undertaken for the Base Year – 2022, Opening Year – 2025, Opening Year +5 – 2030 and Opening Year +15 – 2040.

**Source of information**

A variety of different data sources have been used, including:

- 12-hour classified turning counts (3 sites, refer Figure 7.2);
- Background OS Mapping and aerial photography;
- On-site junction measurements including saturation flows, link speeds, queue length measurements, pedestrian movements at signalled crossings and geometric data for each of the modelled junctions;

## 7.2 Description of Baseline/ Existing Environment

### 7.2.1 Site Location and Composition

The application site is located on the lands to the west of Delaney's GAA Club, with access onto Old Whitechurch Road and to Upper Dublin Hill by means of a right of way over the main access road serving Delaney's GAA Club. The location of the access road is within the 50kph speed limit zone on both main roads. The site is bounded by the Delaney's GAA club to the east and Old Whitechurch Rd. to the west.


**Figure 7.1: Existing Site Boundary**

The proposed development is well located in close proximity to working centres and amenities. Existing services within 20 mins walk of the development include the St. Aidan's Community College, SouthDoc Blackpool, Aldi, Woodies, Planet Entertainment Centre, and Planet Health Club. Blackpool Shopping Centre and its surrounds lies within 25 mins walk of the development.

There are a number of bus stops within close proximity to the development:

- The Upper Kinvara Road stop (ID 244381), the Dublin Hill stop (ID 244391), and the Old Mallow Road stop (ID 255151) are all within a 15-minute walk to the development. Access to the 207, 215, and 248 bus services is provided via these stops.
- The 207-bus route which operates 7 days a week and runs a 30min service, serves Donnybrook, Douglas, Ballyvolane, and Cork City Centre.
- The 215-bus service runs a 30min service and serves Blarney, Cork City Centre and Mahon Point. This service runs 7 days a week.
- The 248-bus service operates Monday-Friday service Cork City, Carrignavar, and Glenville.

### 7.2.2 Baseline Traffic Conditions

A total of 3 no. turning count surveys were undertaken as part of the study on Tuesday 5th April 2022, as outlined in the following figure; these surveys were carried out simultaneously using video cameras at each of the junctions for a 12-hour period.


**Figure 7.2: Traffic Count Survey Locations**

The following figures present the recorded 12-hour traffic profile, number of vehicles per turning movement, and percentage of classified vehicles for each of the surveyed sites carried out on Tuesday 5th of April 2022:

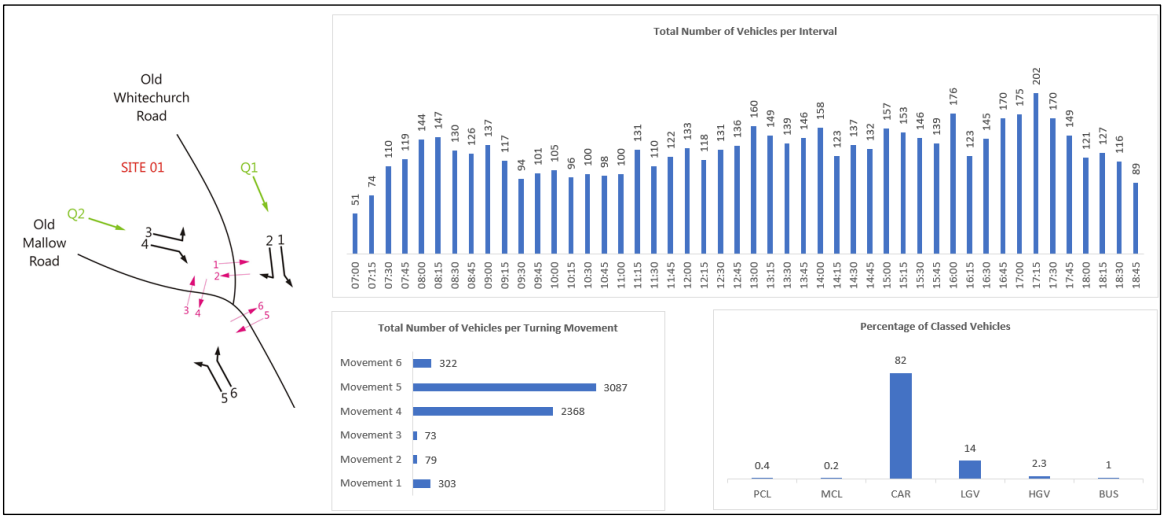


**Figure 7.3: Site 1: Old Whitechurch Rd./Old Mallow Rd. junction**

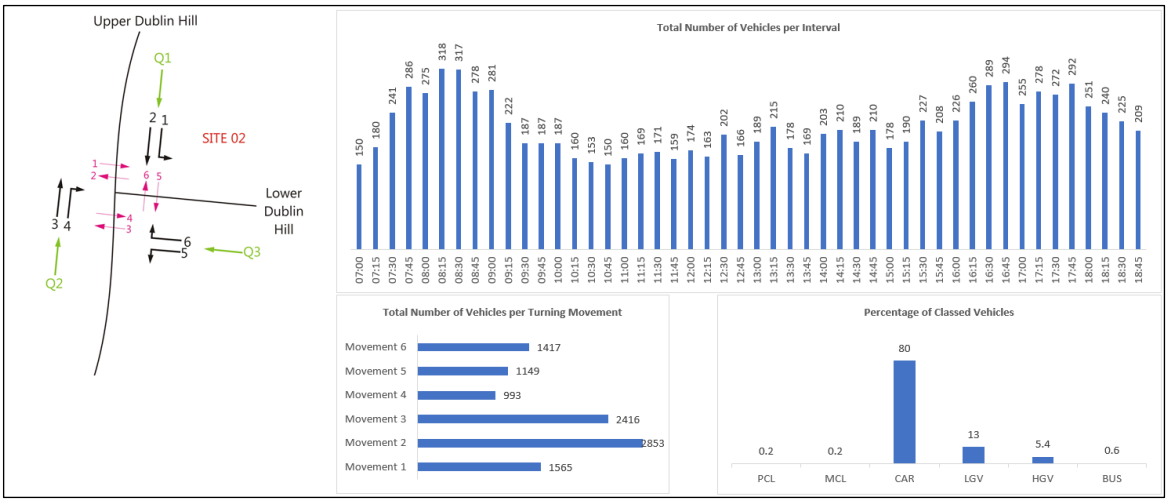


**Figure 7.4: Site 2: Upper Dublin Hill/ Lower Dublin Hill junction**

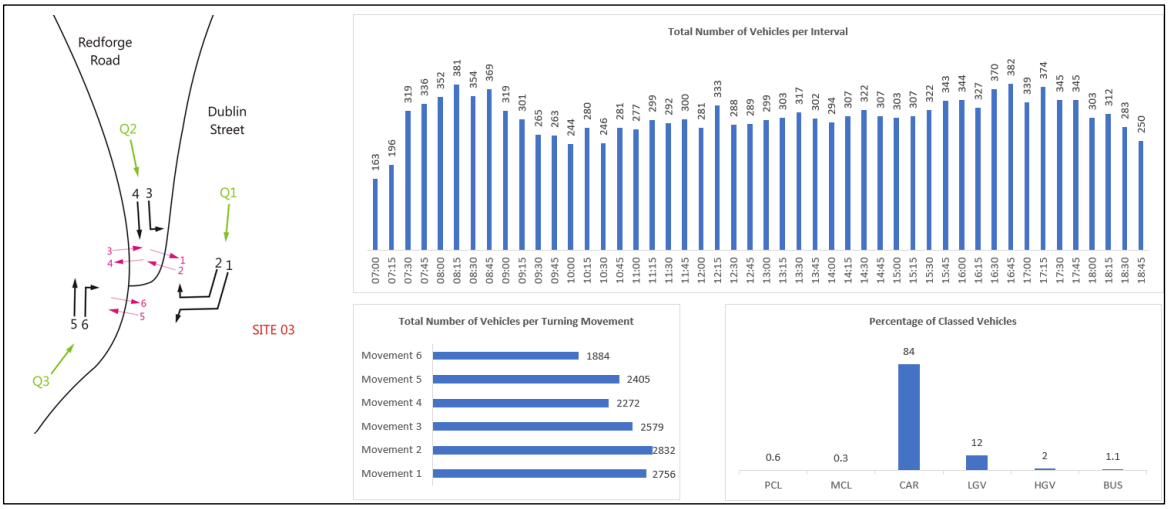


**Figure 7.5: Site 3: Redforge Rd./ Dublin St. junction**

On-site measurements including lane widths, junction turning radii, lane lengths and saturation flows were undertaken by MHL and were incorporated in the constructed models.

The data presented in the above figures shows the peak hour traffic periods for both morning and evening respectively at each junction as follows:

- Site 1: 08:00 – 09:00 and 16:45 – 17:45
- Site 2: 07:45 – 08:45 and 16:30 – 17:30
- Site 3: 08:00 – 09:00 and 16:30 – 17:30

For the purpose of the modelling analysis, each of the above peak hour traffic periods are included in order to obtain the worst-case traffic build-up results. This ensures a robust analysis of the road network is conducted. The percentage of classified vehicles was used within the generated traffic models to accurately reflect existing conditions.

### 7.2.3 Local Roads Network

The following junctions were identified as the key junctions in the area surrounding the proposed development.

**Junction 1: Access Road junction with Old Whitechurch Road**

This priority junction serves as a vehicular access between the Rathpeacon/ Whitechurch area of Cork and the greater Cork City urban area. The measured two-way AADT (Annual Average Daily Traffic) at the junction is 620.


**Figure 7.6: Image of existing Access Road junction with Old Whitechurch Road**

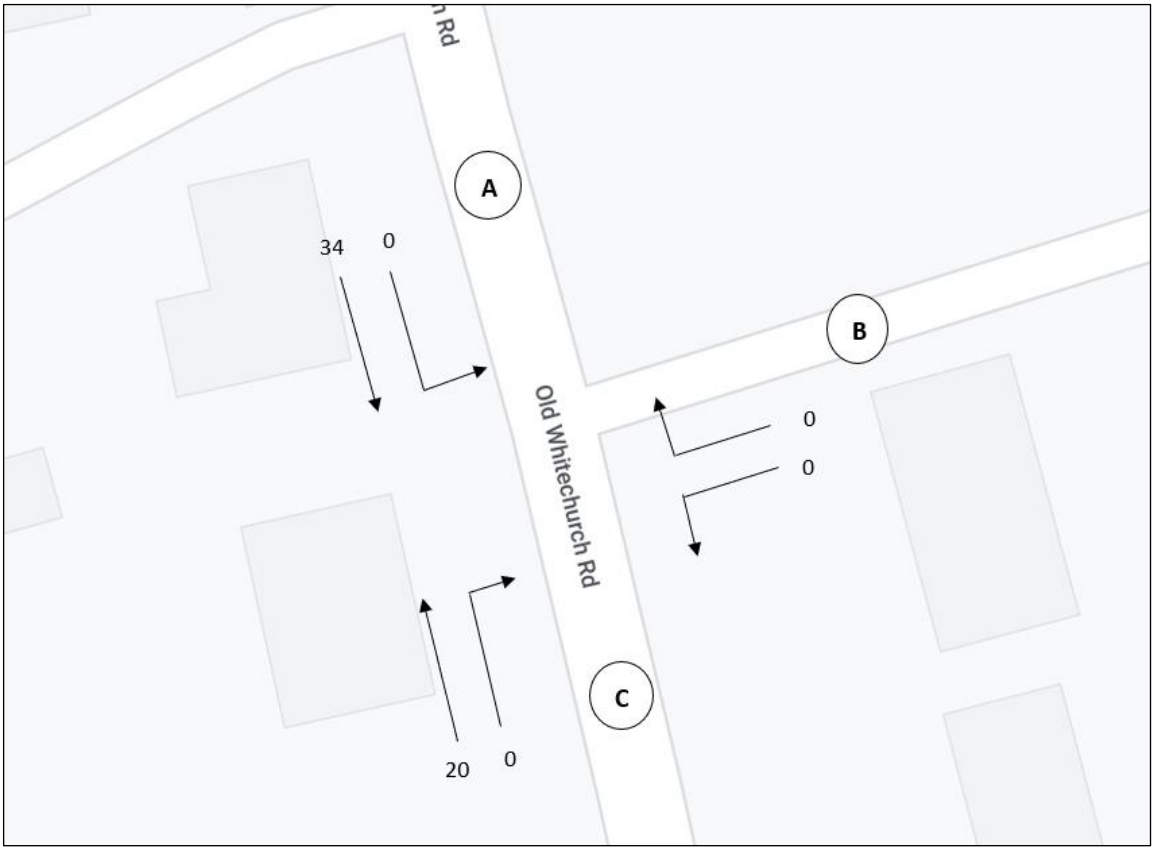


**Figure 7.7: Access Road junction – AM Peak Hour Flows**

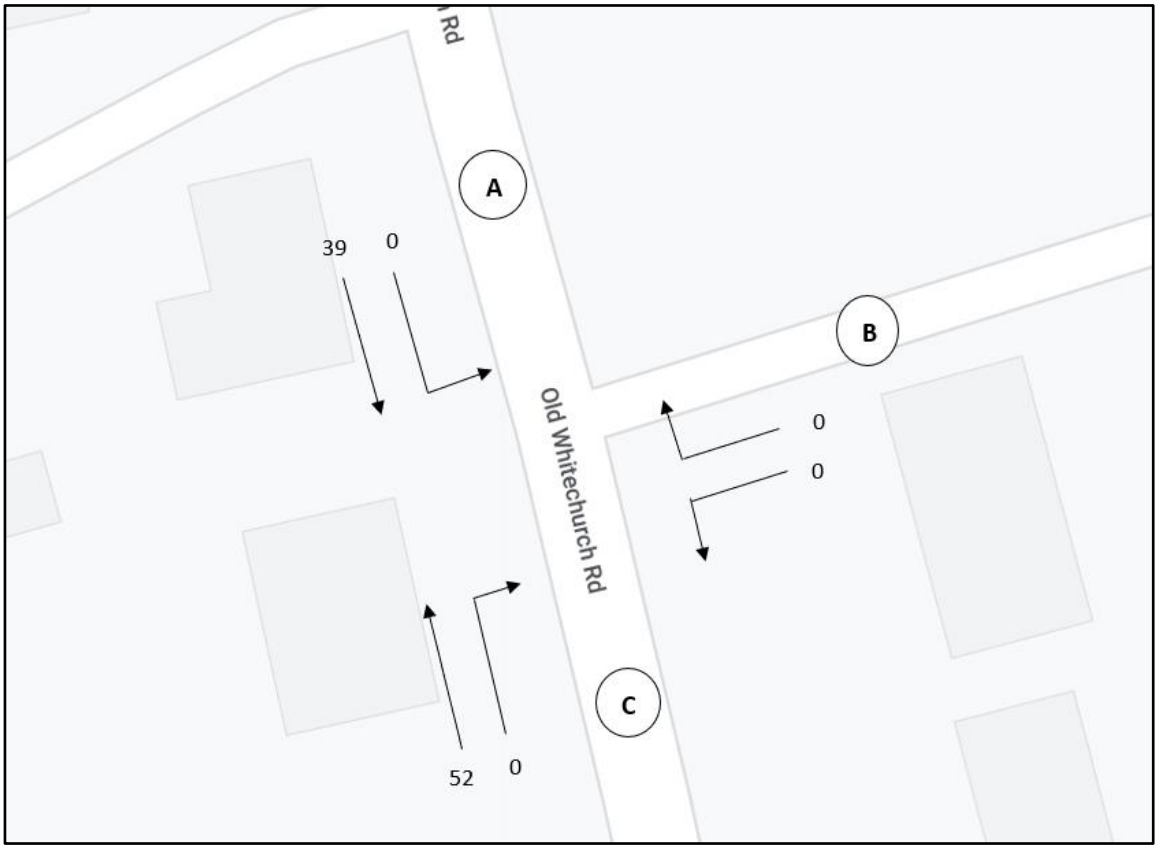


**Figure 7.8: Access Road junction – PM Peak Hour Flows**

**Junction 2: Old Whitechurch Rd./ Old Mallow Rd.**

This Signalised Junction serves as a primary access towards the Blackpool Shopping Centre and into Cork City via the N20. The measured two-way AADT (Annual Average Daily Traffic) at the junction is 6145.

**Figure 7.9: Image of Junction 2: Old Whitechurch Rd./Old Mallow Rd.**

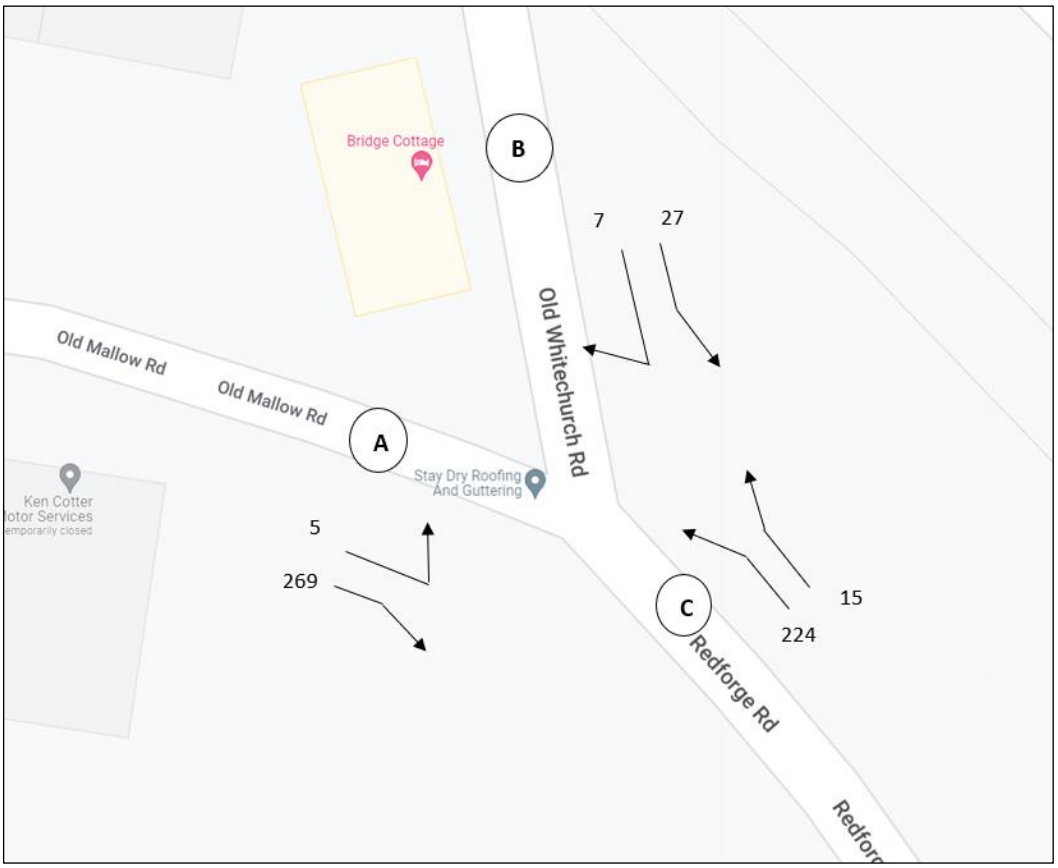


**Figure 7.10: Old Whitechurch Rd./ Old Mallow Rd. – AM Peak Hour Flows**

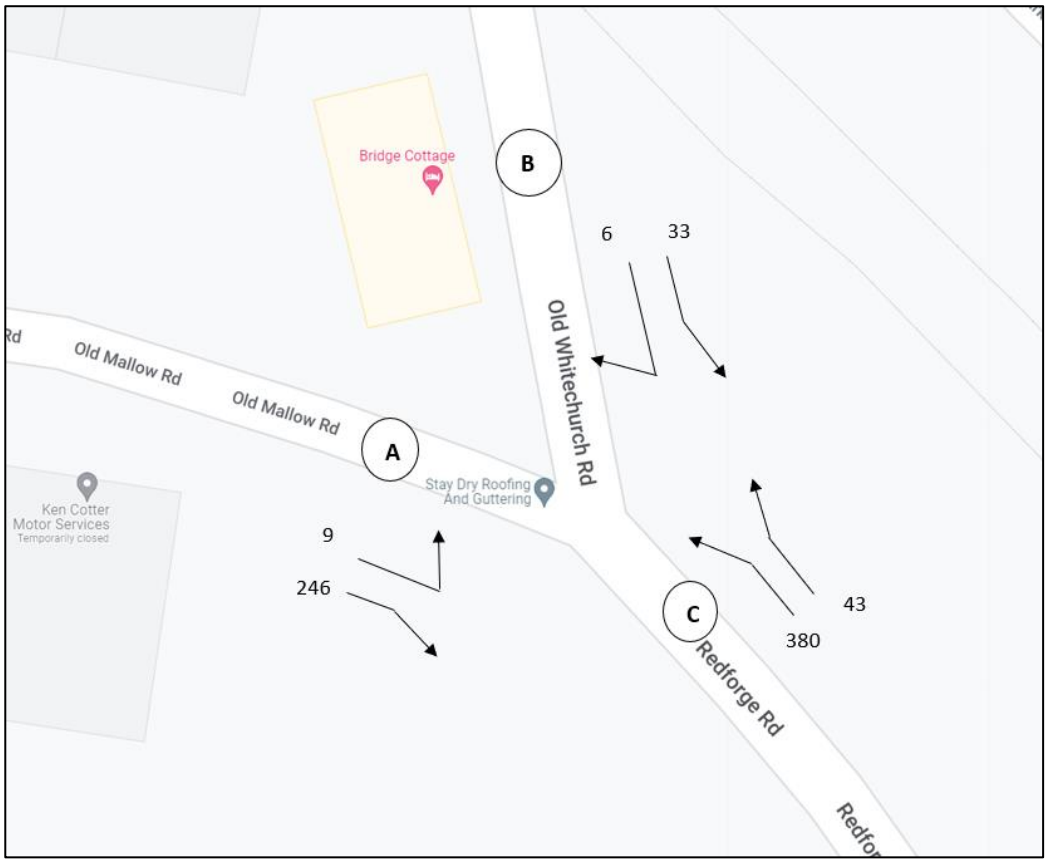


**Figure 7.11: Old Whitechurch Rd./ Old Mallow Rd. - PM Peak Hour Flows**

**Junction 3: Redforge Rd./ Dublin Hill**

This signalised junction forms a link between the Dublin Hill/ White's Cross area to the Blackpool shopping and Cork City. Traffic heading to Cork City travels either south along Dublin St. towards Watercourse Rd. or travels north along Redforge Rd. towards the Brother Delaney Rd. junction. The measured two-way AADT (Annual Average Daily Traffic) at the junction is 16,360.

**Figure 7.12: Redforge Rd./ Dublin Hill Junction**

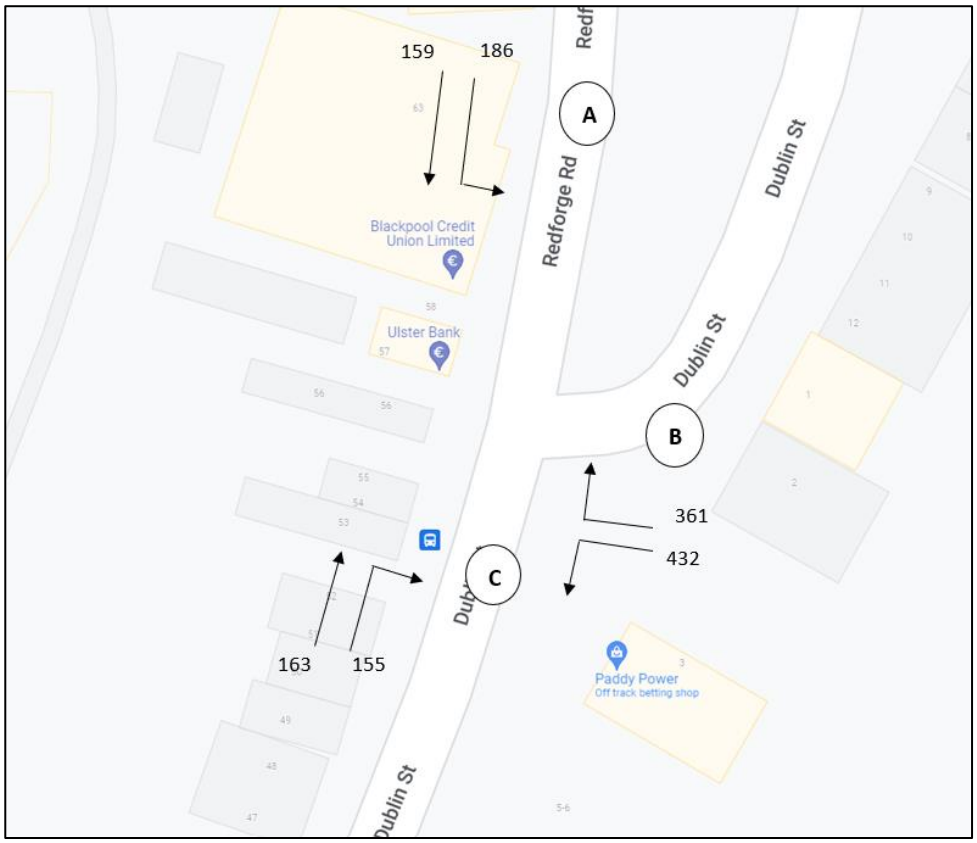


**Figure 7.13: Redforge Rd./ Dublin Hill Junction. – AM Peak Hour Flows**

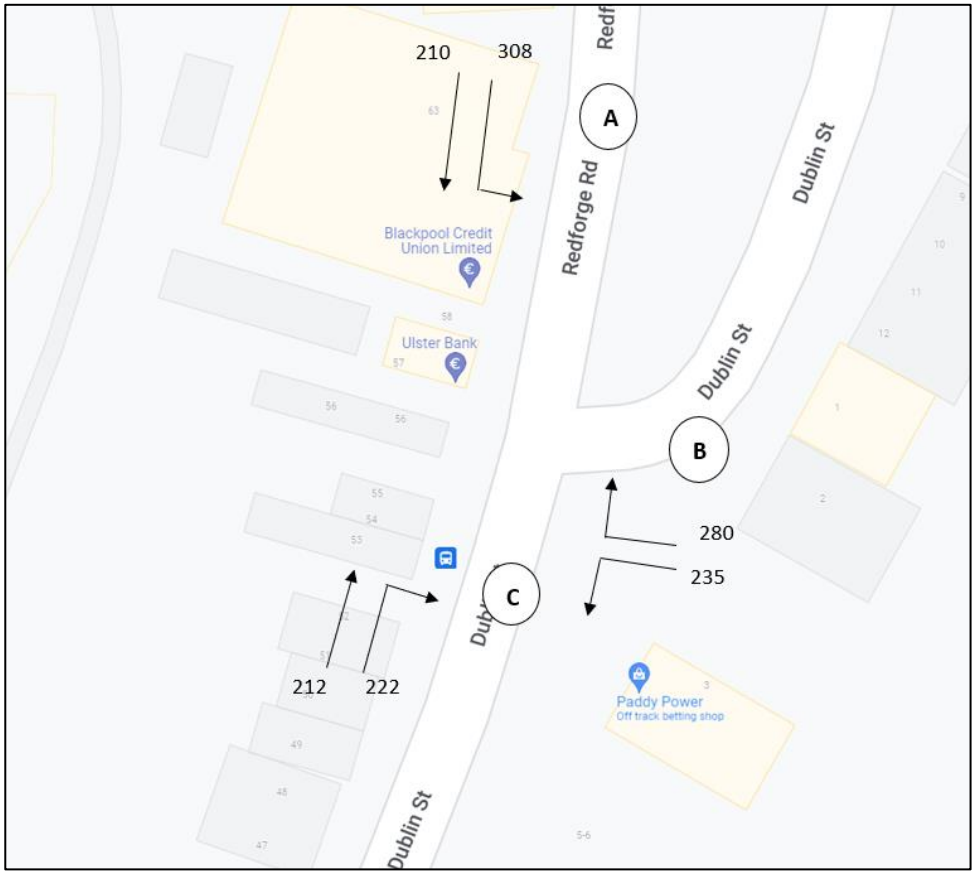


**Figure 7.14: Redforge Rd./ Dublin Hill – PM Peak Hour Flows**

**Junction 4: Kilbarry Enterprise Centre Rd./ Upper Dublin Hill**

This priority junction provides access to the Kilbarry Enterprise Centre and Delaney's GAA pitch from Upper Dublin Hill. The measured two-way AADT (Annual Average Daily Traffic) at the junction is 10,655.

**Figure 7.15: Kilbarry Enterprise Centre Rd./ Upper Dublin Hill Junction**

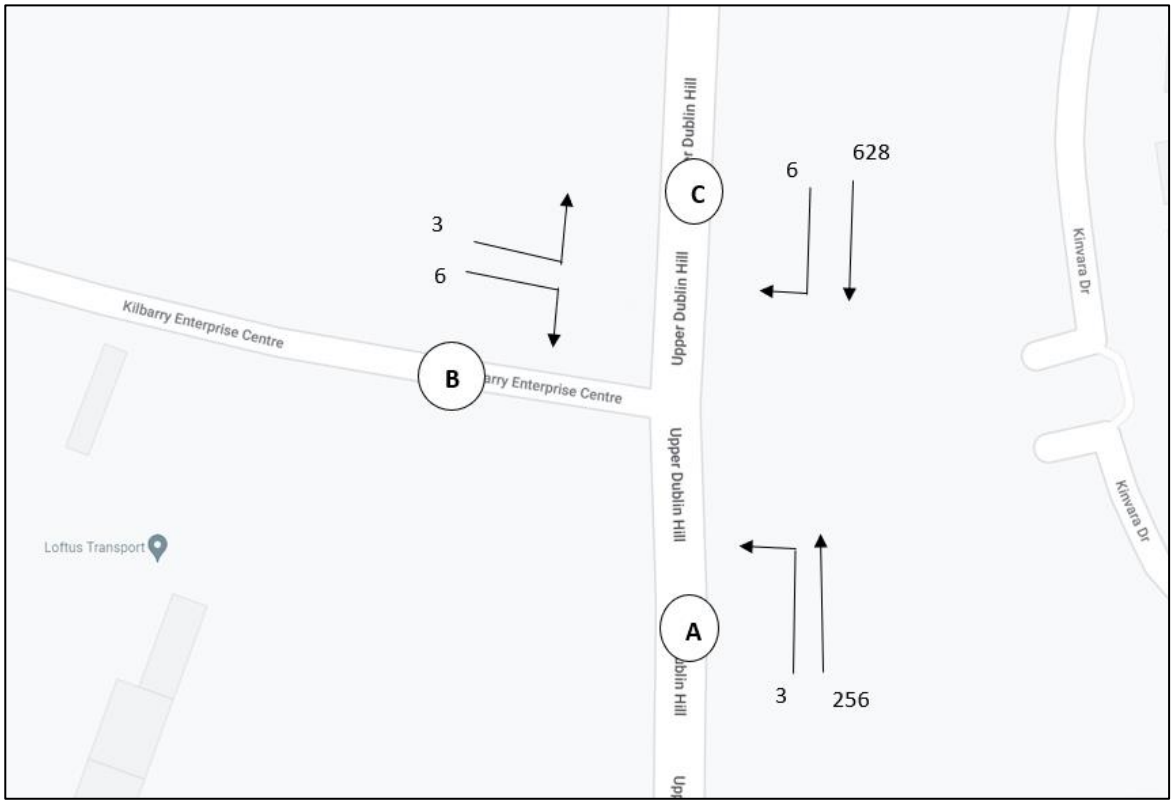


**Figure 7.16: Kilbarry Enterprise Centre Rd./ Upper Dublin Hill Junction – AM Peak Hour Flows**

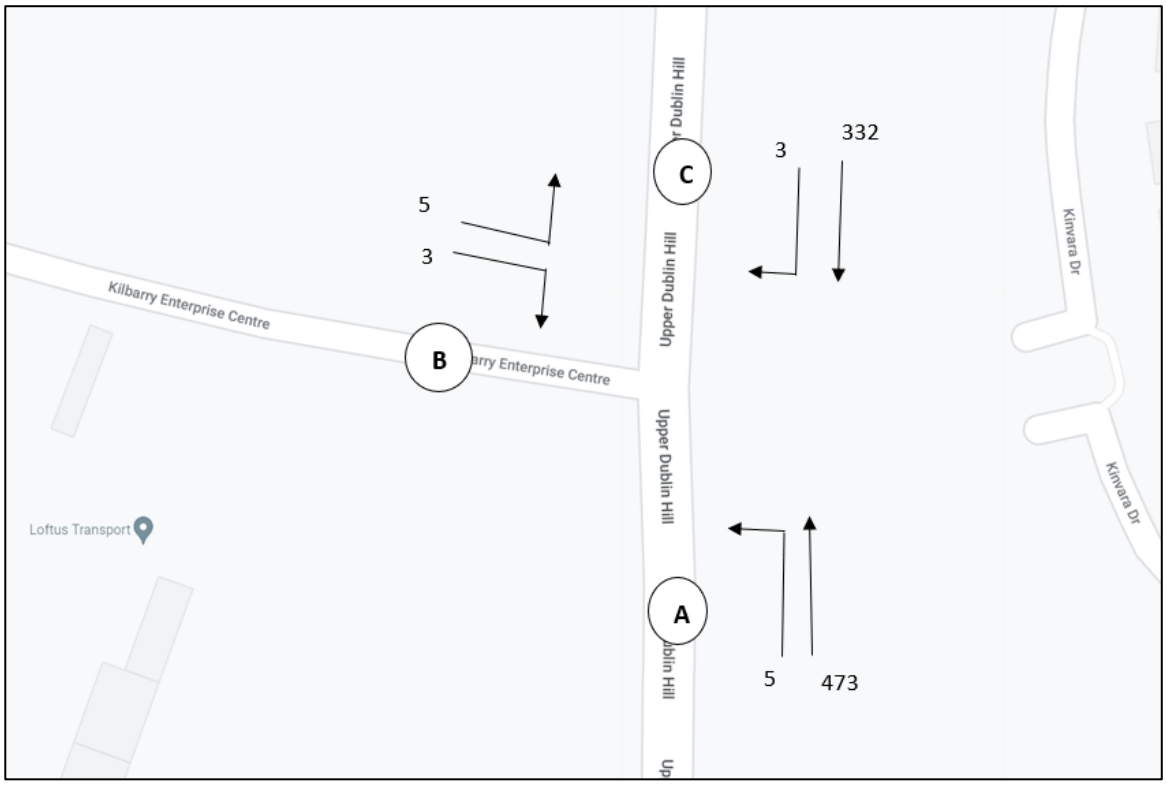


**Figure 7.17: Kilbarry Enterprise Centre Rd./ Upper Dublin Hill Junction – PM Peak Hour Flows**

**Junction 5: Upper Dublin Hill/ Lower Dublin Hill**

This priority junction forms a major link into the Blackpool shopping centre and onwards to Cork City. The measured two-way AADT (Annual Average Daily Traffic) at the junction is 14,125.

**Figure 7.18: Upper Dublin Hill/ Lower Dublin Hill Junction**

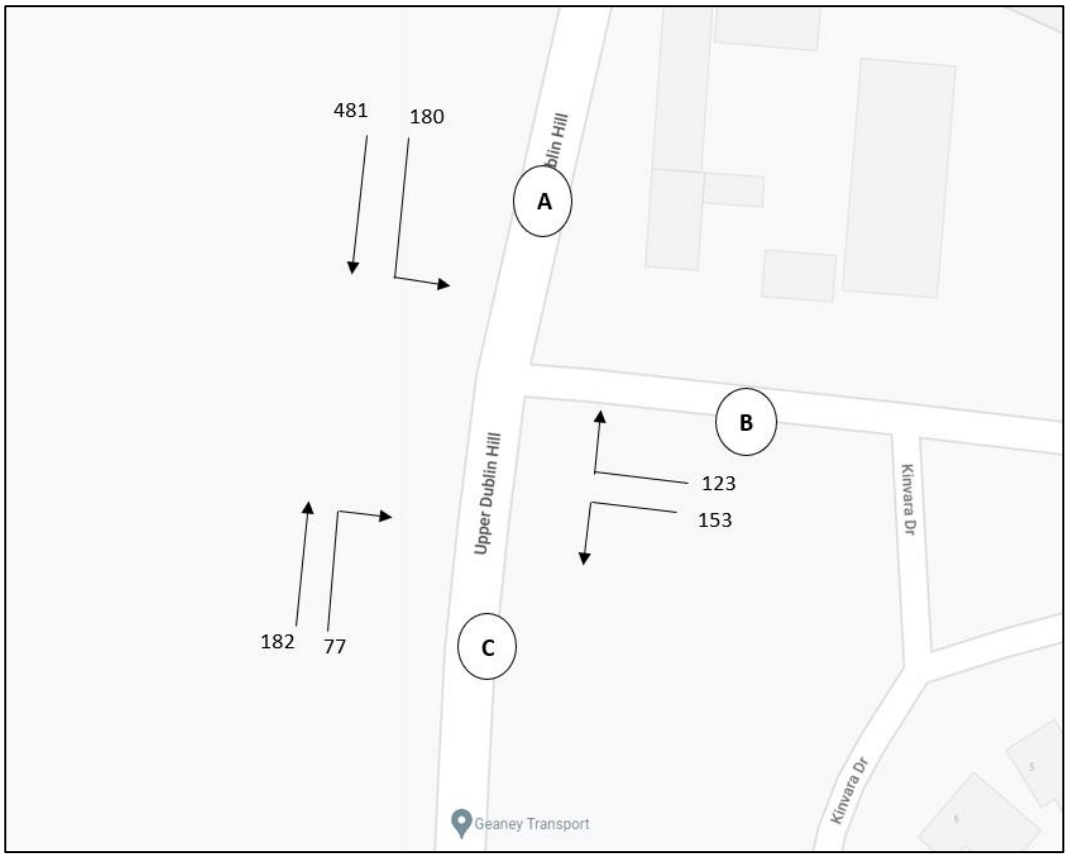


**Figure 7.19: Upper Dublin Hill/ Lower Dublin Hill – AM Peak Hour Flows**


**Figure 7.20: Upper Dublin Hill/ Lower Dublin Hill – PM Peak Hour Flows**

### 7.2.4 Committed Transport Proposals

The publication of the CMATS (Cork Metropolitan Area Transport Study) document proposes major upgrades to public transport provision to serve the City Public Transport Network. These measures will contribute to an expected increase in modal shift towards sustainable travel resulting in a reduction in traffic generation from residential developments. Figure 3.5.1 outlines the 9 measures proposed to achieve this aim.

As part of this assessment, allowance was made for a modal shift of 40% (current sustainable travel usage in the area as per 2016 census was 19%) for development traffic only, in the Design Year 2040. This represents a 21% increase in modal shift over current levels and has been applied to 'new development traffic' only. The use of an increased modal shift for development traffic is justified based on the expected increase in public transport options available in the vicinity of the development brought on by BusConnects and the proposed infrastructure improvements per CMATS.

The resulting reduction in traffic generation from the site has not been applied to background traffic flows, refer to Chapter 6.0 of this report for further details.

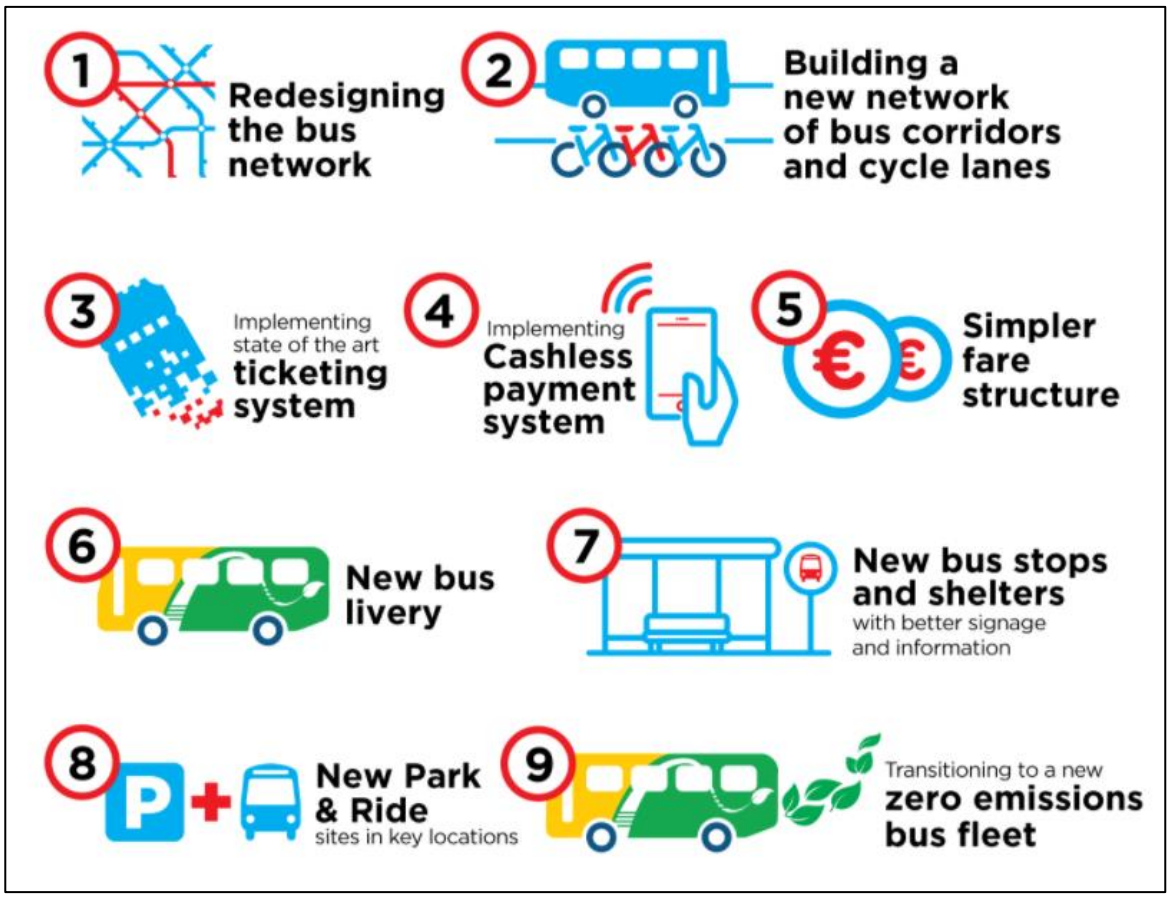


**Figure 7.21: BusConnects Cork – Measures proposed to increase public transport usage**

The route for a proposed Northern Distributor Road is included within CMATS and extends in very close proximity to the development site. The proposed route included in CMATS is indicative only but serves as a good indicator of the route to be taken. Figure 5.22 highlights a potential route for the Northern Distributor Road around the development lands and Delaney's GAA grounds.


**Figure 7.22: Northern Distributor Road – indicative route option**

Per CMATS, the proposed Northern Distributor Road is anticipated for completion in 2031 and will provide a direct route for local traffic to avoid the major traffic centres of Blackpool and the City Centre when wishing to travel to the N22 west or the N8 east.

### 7.2.5 RSA Collision Data

At the time of undertaking this assessment, the RSA Road Collision Statistics were not available in the vicinity of the development.

## 7.3 Characteristics of the Proposed Development

### 7.3.1 Description of the Proposed Development

The proposed development will consist of a strategic housing development of 319no. residential dwellings comprising of 85no. semi-detached units (comprising of 17no. 4-bed units and 68no. 3-bed units), 118no. terraced units (comprising of 8no. 4-bed units, 60no. 3-bed units and 50no. 2-bed units), 53no. duplex units (comprising of 26no. 1-bed units, 25no. 2-bed units and 2no. 3-bed units) and 63no. apartments (in 3no. part 4 storey and part 5-storey blocks and comprising 15no. 1-bed units and 48no. 2-bed units). The development also includes the provision of a crèche facility (519sqm) and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is 33,738.70sqm.

The proposed development will also consist of the demolition of a disused hurley manufacturing factory and associated out buildings, the removal and replacement of the southern and eastern boundary treatments, as well the creation of formalised walking paths to replace the informal walking paths located to the north of the site, a new through road from the proposed site access on the Old Whitechurch Road to Delaney's GAA Grounds and accessing the Upper Dublin Hill Road, with associated new boundary treatments at Delaney's GAA club, all associated ancillary site development and hard and soft landscaping works, to include the provision of private, communal and public open space, waste storage areas, bicycle, motorcycle and car parking, including EV and disabled parking, esb substations, groundworks, foul drainage works, stormwater drainage proposals

including directional drilling for the stormwater outfall, water supply proposals, public lighting, and all new boundary treatments.

The following figure presents the scheme layout, the subject of this application.

**Figure 7.23: Proposed Site Layout**

### 7.3.2 Phasing of the Proposed Scheme

The proposed development will be completed in three phases, with an indicative commencement date in 2023 and finishing by 2025. The proposed creche will be delivered in phase 1. The Traffic Impact Assessment includes the design year 2023 (phase 1 complete), the design year 2024 (phase 2 complete), the proposed opening year of 2025, the opening year +5 (2030), and the opening year +15 (2040). Refer to Section 7.4.2.2.3 Trip Generation for details regarding the number of units and volume of traffic associated with each phase.

## 7.4 Potential impact of the proposed development

### 7.4.1 Do nothing scenario

The local roads network has been assessed for the Do-Nothing Scenario and is presented as the 'without dev' results for the modelled junctions. The results tables generated by the Junctions 9 PICADY and the LinSig traffic modelling packages have been constructed to allow a direct comparison to be made between the with/without scenarios for each of the years and peak periods, refer to Section 7.4.2.2.5 Network Modelling Results.

### 7.4.2 Impact Assessment

**Construction phase**

The proposed development will impact on the surrounding roads network during construction and operational stages. It is broadly accepted that operational stage traffic will exceed that of construction stage traffic and will be potentially less manageable in terms of avoiding peak hour traffic periods. Therefore, traffic models of the assessed junctions have been developed with operational phase traffic presenting a worst-case scenario.

**Operational phase**

In order to assess the impact of the proposed development on the identified study area, the key junctions have been assessed both with/without development traffic for both AM and PM peak hours. Results are presented for design year 2023 (phase 1 complete), the design year 2024 (phase 2 complete), the proposed opening year of 2025, the opening year +5 (2030), and the opening year +15 (2040).

For the purpose of the modelling analysis, each of the peak hour traffic periods, as determined by the completed traffic surveys, are included in order to obtain the worst-case traffic build-up results. This ensures a robust analysis of the road network is conducted.

**Traffic Forecasting**

The TII Guidelines have been followed when forecasting growth rates for background traffic for the area. Recorded background traffic was factored using TII (Transport Infrastructure Ireland) Project Appraisal Guidelines (PE-PAG-02017) for use in future year scenarios. The following table presents the factors used on recorded PCU's based on Link Based Growth Rates (Central Growth) for the Cork Metropolitan Area.

| | Cars/LGV | HGV | Combined |
|---|---|---|---|
| Count % | 97% | 3% | **100%** |
| **2022 to 2023** | 1.017 | 1.029 | **1.017** |
| **2022 to 2024** | 1.034 | 1.060 | **1.035** |
| **2022 to 2025** | 1.052 | 1.091 | **1.053** |
| **2022 to 2030** | 1.143 | 1.261 | **1.147** |
| **2022 to 2040** | 1.237 | 1.420 | **1.243** |

**TII Project Appraisal Guidelines for National Roads Unit 5.3**
*Travel Demand Projections (PE-PAG-0217-02)*

**Figure 7.24: Background Traffic Growth Rates Per Annum**

**Modal Shift**

This section describes the current level of modal shift (the use of sustainable modes of travel) based on available data and compares these to national targets.

The 2016 Census online SAP data was used to assess current modal shift patterns in the St. Marys Area which encompasses the site. 19% of people in this area said they were commuting on foot, bike or using public transport.

Future national targets in the range of 40% are being pursued by all Local Authorities and the Kilbarry area is part of future public transport upgrade proposals. Given the location of the proposed development and based

on the increased density of development, a limited increase in sustainable transport is expected. A change in the local demographic to a younger population (lower car ownership) will also facilitate this change.

A modal split of 40% (implying an anticipated increase in public transport or active travel in the immediate area of 21%) for the Opening Year +15 (2040) scenario is deemed to be reasonable.

This modal shift of 21% will not be applied to the other modelled scenarios as it is unlikely that the proposed surrounding infrastructure, as depicted in CMATS, would be completed by the respective scenario years (e.g., the proposed Northern Distributor Road). Additionally, to ensure a robust analysis of the wider road network, the modal shift will not be applied to background network traffic.

Population aged 5 years and over by means of travel to work, school or college

Chart Table

Download

Show 25 entries Search:

| Means of Travel | Population aged 5 years and over by means of travel to work (Number) | Population aged 5 years and over by means of travel to school or college (Number) | Population aged 5 years and over by means of travel to work, school or college (total) (Number) |
|---|---|---|---|
| On Foot | 95 | 322 | 417 |
| Bicycle | 27 | 5 | 32 |
| Bus, minibus or coach | 83 | 162 | 245 |
| Train, DART or LUAS | 2 | 0 | 2 |
| Motorcycle or scooter | 11 | 3 | 14 |
| Car Driver | 1,414 | 96 | 1,510 |
| Car passenger | 151 | 996 | 1,147 |
| Van | 156 | 4 | 160 |
| Other (incl. lorry) | 16 | 0 | 16 |
| Work mainly at or from home | 65 | 0 | 65 |
| Not stated | 67 | 73 | 140 |
| Total | 2,087 | 1,661 | 3,748 |

**Figure 7.25: 2016 Modal Shift by means of travel to work, school or college. (Electoral Division of St. Marys)**

### Trip Generation

This section describes the traffic generation from the proposed development and is based on the TRICS Database as outlined in the separate Traffic and Transport Assessment accompanying this submission.

The following tables present the expected AM/PM traffic generation figures from the residential housing and creche within the scheme. This traffic is added to the measured background flows to develop future year traffic models of the identified junctions. The distribution of these 'new' trips onto the roads network will be in-line

with recorded patterns of flow. The term 'new' trips implies that it is assumed that all residents and end users of the residential element of the scheme are new to the area.

It is assumed that a portion of the Creche demand will be derived from the proposed development, however, in order to carry out a robust assessment of the roads network it is assumed that 80% of traffic that would be generated by a standalone creche will be attracted to the proposed development.

| Phase 1 only | | AM PEAK | | PM PEAK | |
|---|---|---|---|---|---|
| | | Arrivals | Departures | Arrivals | Departures |
| New Residential Houses Trip Generation - based on TRICs database | | | | | |
| 109 | Peak Trics Trip Rates Per Unit | 0.192 | 0.555 | 0.487 | 0.294 |
| | Peak Trips No. Units | 21 | 60 | 53 | 32 |
| | TOTAL | 81 | | 85 | |
| New Residential Apartments Trip Generation - based on TRICs database | | | | | |
| 0 | Peak Trics Trip Rates Per Unit | 0.032 | 0.197 | 0.274 | 0.127 |
| | Peak Trips No. Units | 0 | 0 | 0 | 0 |
| | TOTAL | 0 | | 0 | |
| New Creche Trip Generation - based on TRICs database | | | | | |
| 71 | Peak Trics Trip Rates Per pupil | 0.294 | 0.335 | 0.243 | 0.372 |
| | Peak Trips No. Units | 21 | 24 | 17 | 26 |
| | TOTAL | 45 | | 44 | |
| New Creche Trip Generation - traffic external to new development | | | | | |
| | Factor of creche traffic external to dev. | 0.8 | | | |
| | Peak Trips No. Units | 17 | 19 | 14 | 21 |
| | TOTAL | 36 | | 35 | |

**Figure 7.26 Proposed Development Traffic in 2023**

| Phases 1 & 2 | | AM PEAK | | PM PEAK | |
|---|---|---|---|---|---|
| | | Arrivals | Departures | Arrivals | Departures |
| New Residential Houses Trip Generation - based on TRICs database | | | | | |
| 172 | Peak Trics Trip Rates Per Unit | 0.192 | 0.555 | 0.487 | 0.294 |
| | Peak Trips No. Units | 33 | 95 | 84 | 51 |
| | TOTAL | 128 | | 134 | |
| New Residential Apartments Trip Generation - based on TRICs database | | | | | |
| 42 | Peak Trics Trip Rates Per Unit | 0.032 | 0.197 | 0.274 | 0.127 |
| | Peak Trips No. Units | 1 | 8 | 12 | 5 |
| | TOTAL | 10 | | 17 | |
| New Creche Trip Generation - based on TRICs database | | | | | |
| 71 | Peak Trics Trip Rates Per pupil | 0.294 | 0.335 | 0.243 | 0.372 |
| | Peak Trips No. Units | 21 | 24 | 17 | 26 |
| | TOTAL | 45 | | 44 | |
| New Creche Trip Generation - traffic external to new development | | | | | |
| | Factor of creche traffic external to dev. | 0.8 | | | |
| | Peak Trips No. Units | 17 | 19 | 14 | 21 |
| | TOTAL | 36 | | 35 | |

**Figure 7.27: Proposed Development Traffic in 2024**

| Phases 1, 2, & 3 (Full dev) | | AM PEAK | | PM PEAK | |
|---|---|---|---|---|---|
| | | Arrivals | Departures | Arrivals | Departures |
| New Residential Houses Trip Generation - based on TRICs database | | | | | |
| 256 | Peak Trics Trip Rates Per Unit | 0.192 | 0.555 | 0.487 | 0.294 |
| | Peak Trips No. Units | 49 | 142 | 125 | 75 |
| | TOTAL | 191 | | 200 | |
| New Residential Apartments Trip Generation - based on TRICs database | | | | | |
| 63 | Peak Trics Trip Rates Per Unit | 0.032 | 0.197 | 0.274 | 0.127 |
| | Peak Trips No. Units | 2 | 12 | 17 | 8 |
| | TOTAL | 14 | | 25 | |
| New Residential Trip Generation - allowing for 21% modal shift increase | | | | | |
| | TOTAL (Existing modal split of 19%) | 51 | 154 | 142 | 83 |
| | Factor for increase to 40% modal split | 0.74 | | | |
| | Peak Trips No. Units | 38 | 114 | 105 | 62 |
| | TOTAL w/ modal shift | 152 | | 167 | |
| New Creche Trip Generation - based on TRICs database | | | | | |
| 71 | Peak Trics Trip Rates Per pupil | 0.294 | 0.335 | 0.243 | 0.372 |
| | Peak Trips No. Units | 21 | 24 | 17 | 26 |
| | TOTAL | 45 | | 44 | |
| New Creche Trip Generation - traffic external to new development | | | | | |
| | Factor of creche traffic external to dev. | 0.8 | | | |
| | Peak Trips No. Units | 17 | 19 | 14 | 21 |
| | TOTAL | 36 | | 35 | |

**Figure 7.28: Proposed Development Traffic in 2025**

**Trip Distribution**

This section describes the methodology used in the distribution of development specific traffic onto the modelled network. Figure 7.2 highlights the location of each of the junctions where turning count movements were recorded over a 12-hour timeframe. This 'snapshot' of existing traffic movements provides a basis for determining desire lines which was used to assign development traffic at each of the modelled junctions.

The following figures illustrate the distribution of the proposed development traffic across the existing road network for each of the following scenarios:

- 2023 AM/PM - Phase 1 only (Old Whitechurch Rd. access in operation only)
- 2024 AM/PM - Phases 1 & 2 (Old Whitechurch Rd. access in operation only)
- 2025 AM/PM - Phases 1, 2, & 3 (full development traffic with Old Whitechurch Rd. access in operation only)
- 2030 AM/PM - Dev +5 years (access onto Upper Dublin Hill via existing Delaney's GAA access in operation, no change to modal shift applied)
- 2040 AM/PM With/Without Dev +15 years (with entrance onto Upper Dublin Hill via existing Delaney's GAA access in operation, modal shift to 40% applied)

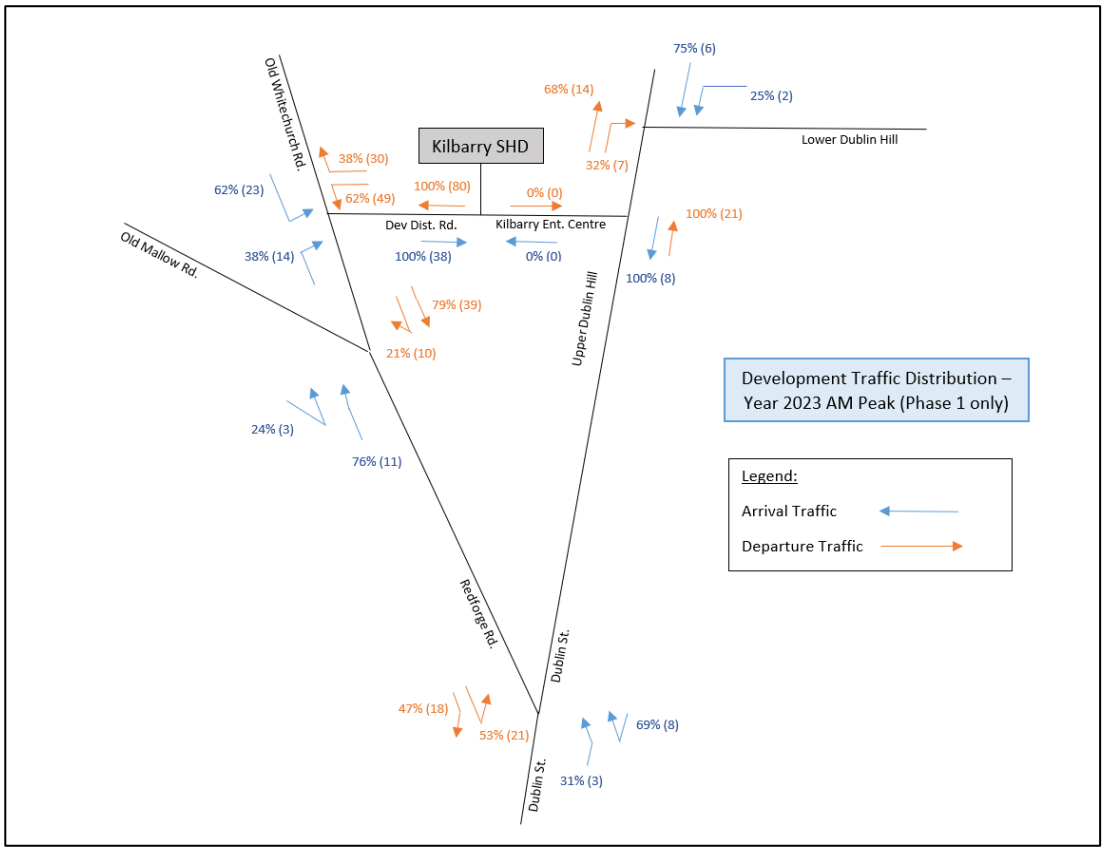


**Figure 7.29: Development Traffic Distribution - Year 2023 AM Peak**

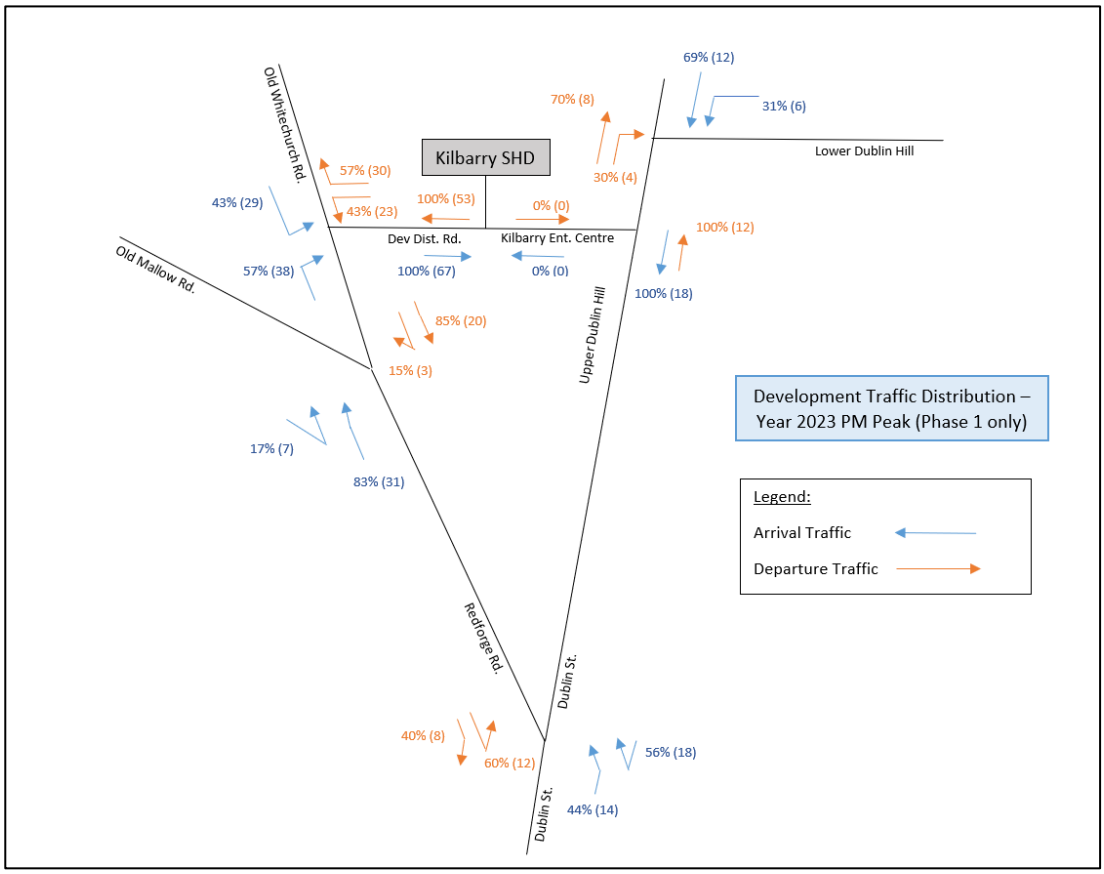


**Figure 7.30: Development Traffic Distribution - Year 2023 PM Peak**

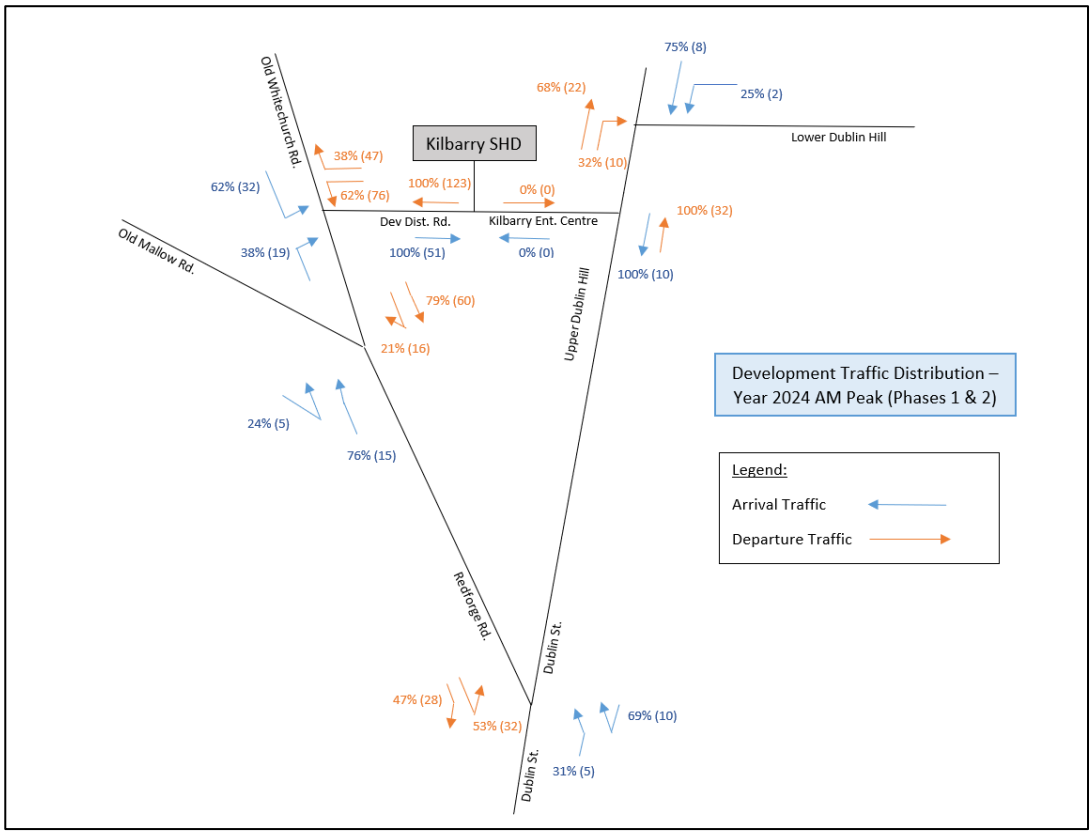


**Figure 7.31: Development Traffic Distribution - Year 2024 AM Peak**

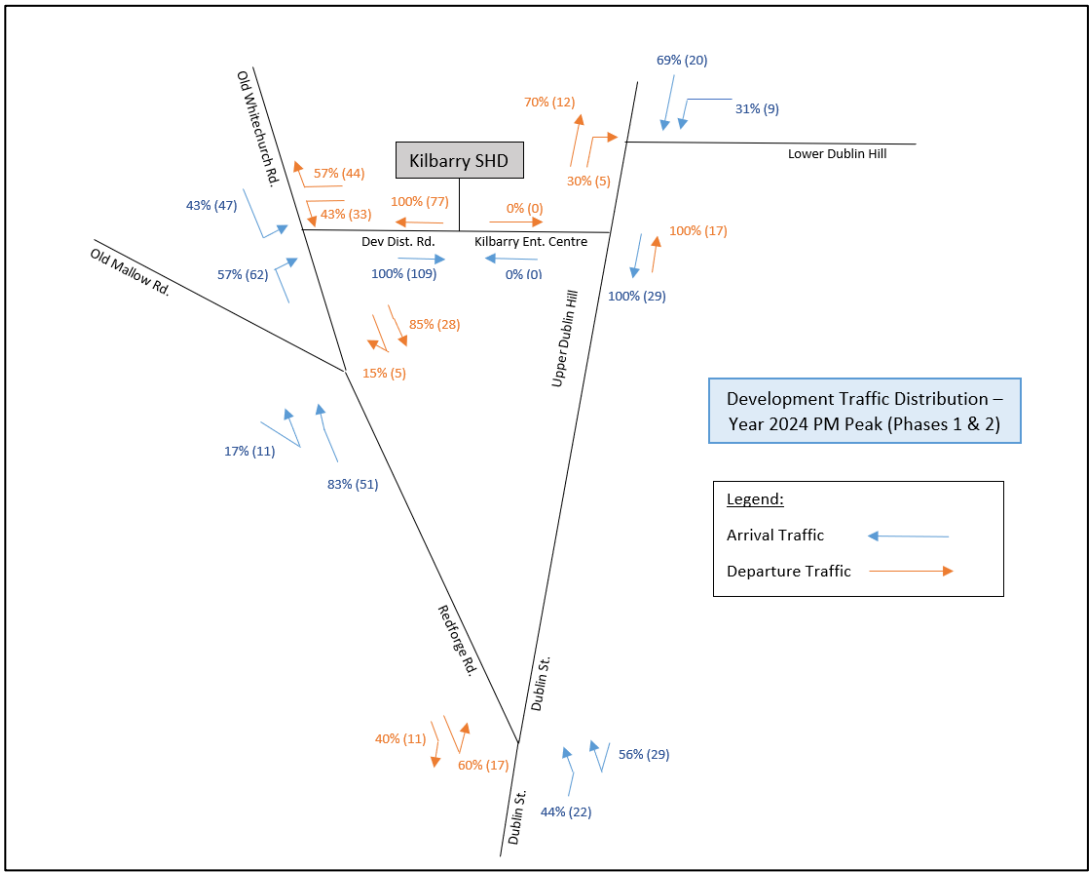


**Figure 7.32: Development Traffic Distribution - Year 2024 PM Peak**

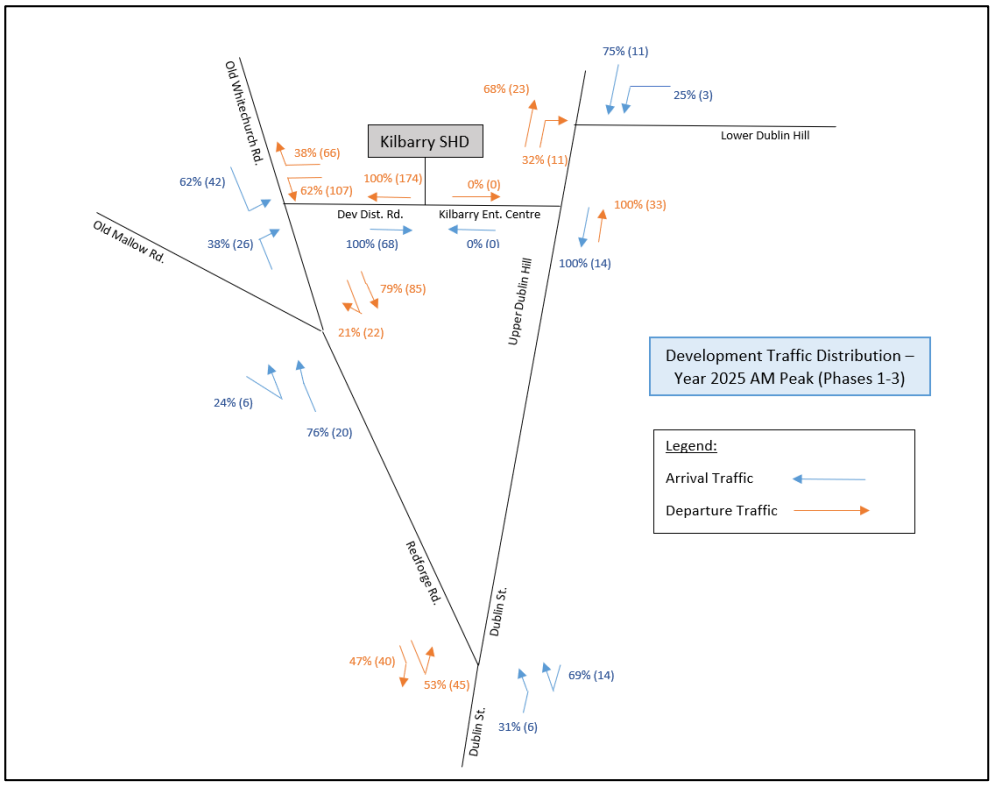


**Figure 7.33: Development Traffic Distribution - Year 2025 AM Peak**

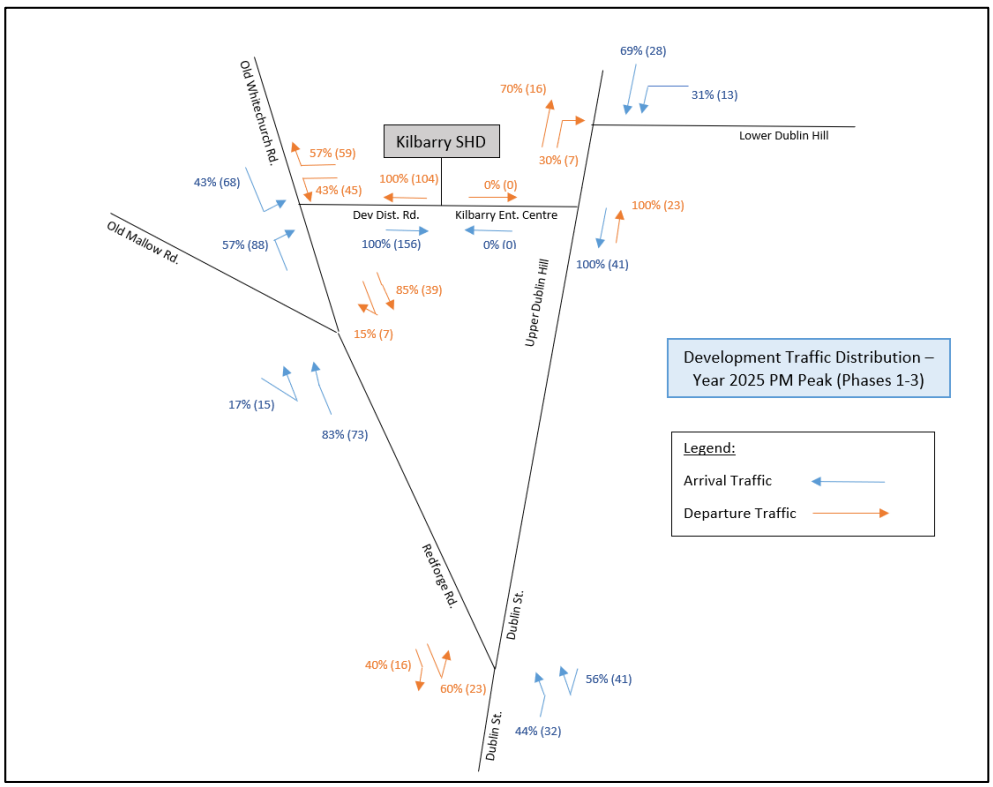


**Figure 7.34: Development Traffic Distribution - Year 2025 PM Peak**

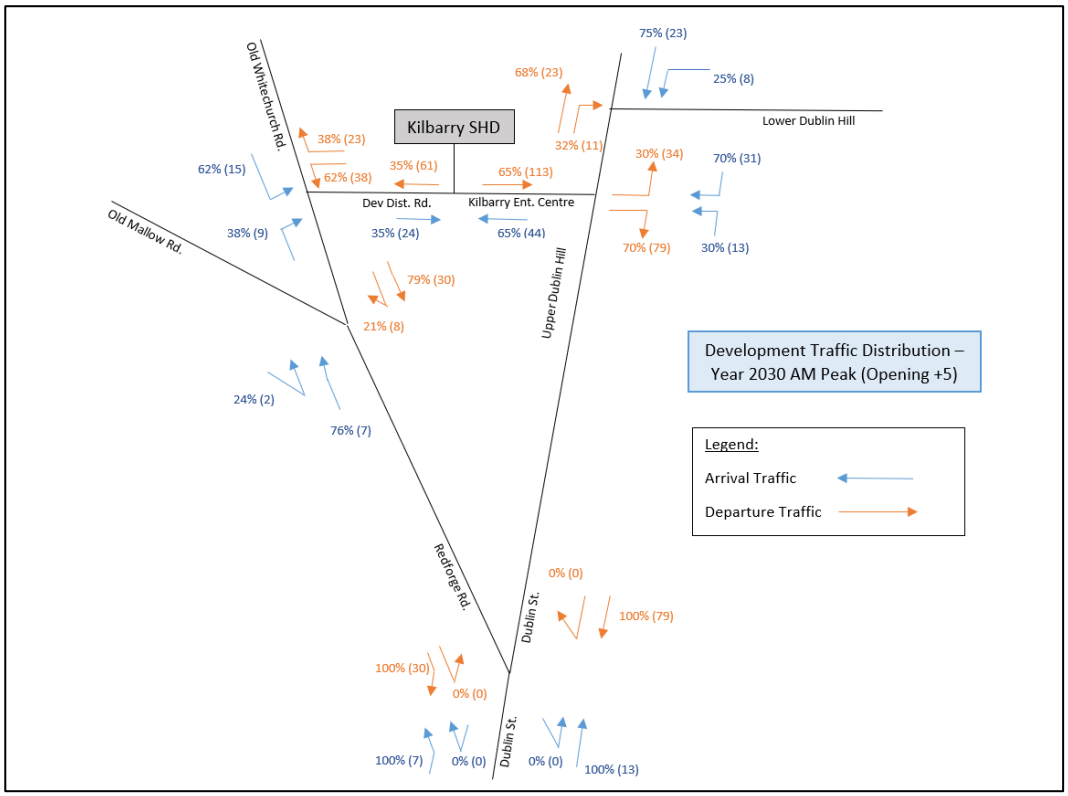


**Figure 7.35: Development Traffic Distribution - Year 2030 AM Peak**

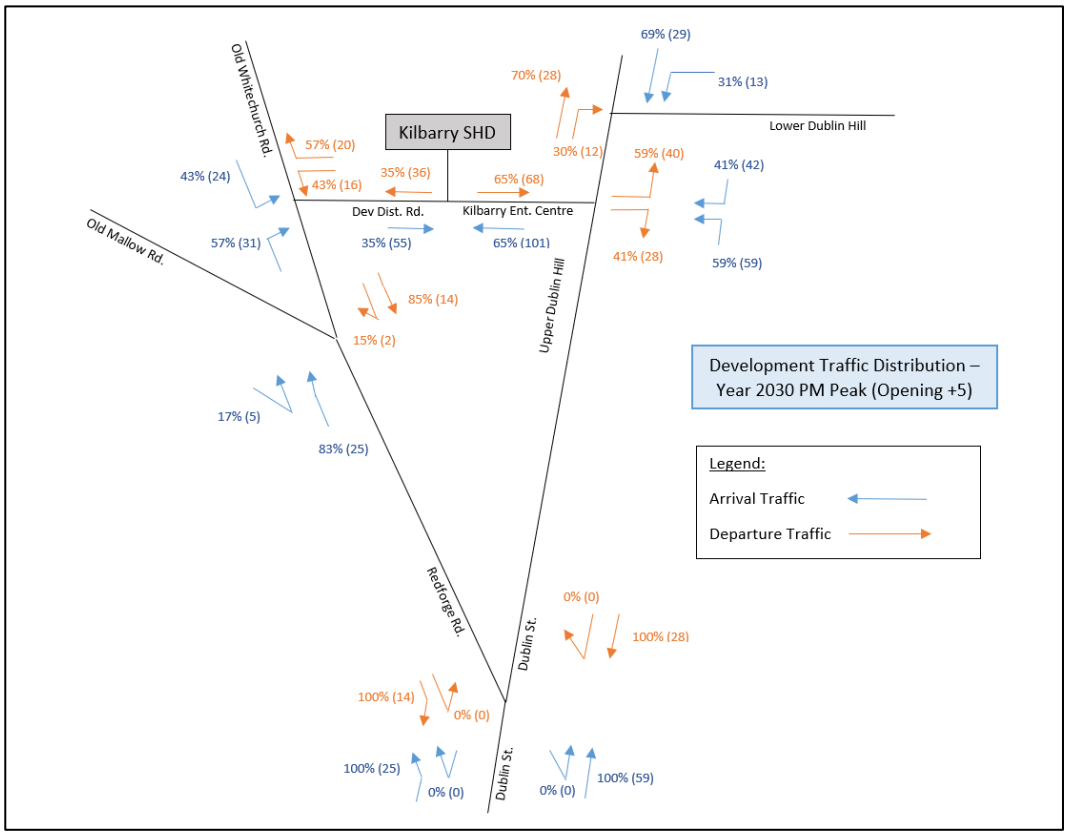


**Figure 7.36: Development Traffic Distribution - Year 2030 PM Peak**

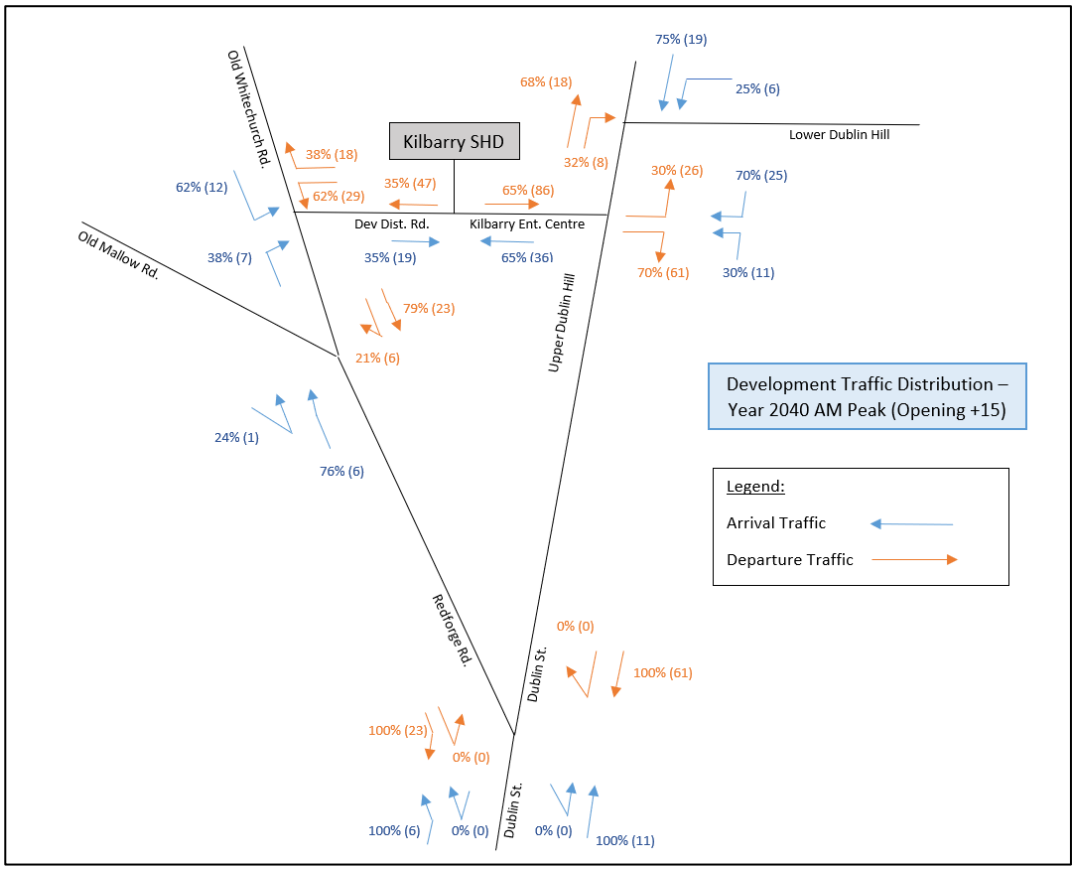


**Figure 7.37: Development Traffic Distribution - Year 2040 AM Peak**

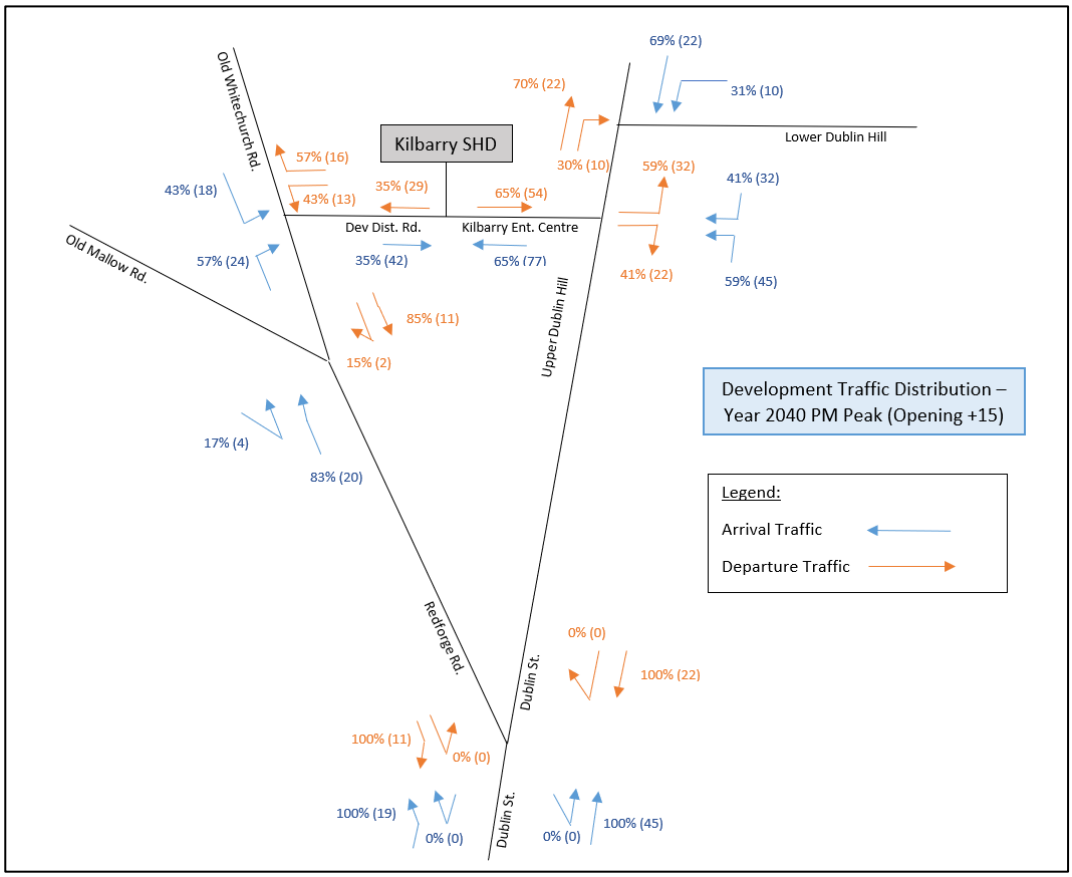

**Figure 7.38: Development Traffic Distribution - Year 2040 PM Peak**

The distribution of development traffic was used to create traffic flow matrices for each Junction when the development is in operation. Traffic flow matrices were developed for each of the following scenarios:

- 2023 AM/PM With/Without Phase 1
- 2024 AM/PM With/Without Phases 1 & 2
- 2025 AM/PM With/Without Phases 1, 2, & 3 (full development)
- 2030 AM/PM With/Without Dev +5 years
- 2040 AM/PM With/Without Dev +15 years

**Junction 1: Access Road junction with Old Whitechurch Road**

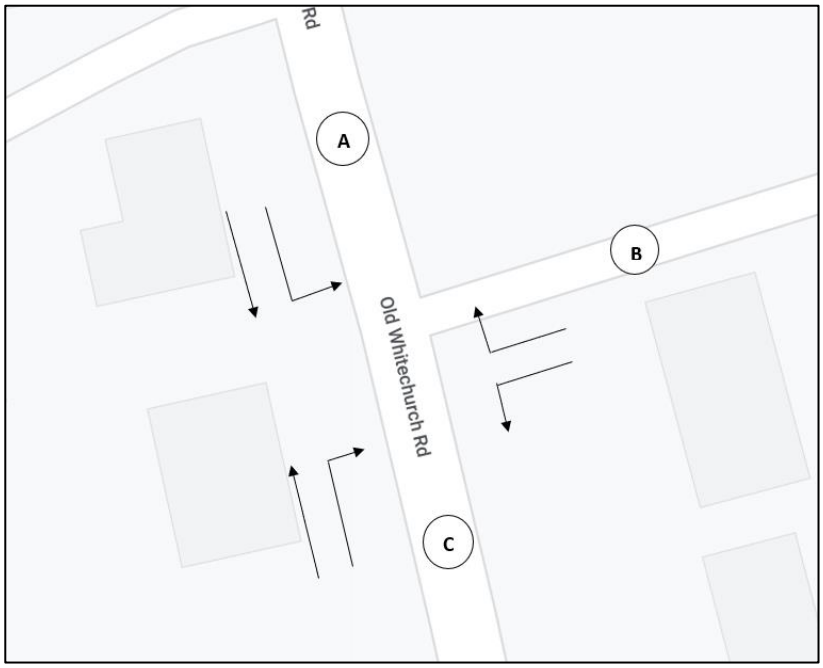


**Figure 7.39: Junction 1 Arm Designation**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 34 | 34 |
| B | 0 | 0 | 0 | 0 |
| C | 21 | 0 | 0 | 21 |
| Total | 21 | 0 | 34 | 55 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 40 | 40 |
| B | 0 | 0 | 0 | 0 |
| C | 52 | 0 | 0 | 52 |
| Total | 52 | 0 | 40 | 92 |

**Table 7.1 Junction 1: 2022 Existing AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 35 | 35 |
| B | 0 | 0 | 0 | 0 |
| C | 21 | 0 | 0 | 21 |
| Total | 21 | 0 | 35 | 56 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 41 | 41 |
| B | 0 | 0 | 0 | 0 |
| C | 53 | 0 | 0 | 53 |
| Total | 53 | 0 | 41 | 94 |

**Table 7.2 Junction 1: 2023 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 23 | 35 | 58 |
| B | 30 | 0 | 49 | 80 |
| C | 21 | 14 | 0 | 36 |
| Total | 52 | 38 | 84 | 173 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 29 | 41 | 70 |
| B | 30 | 0 | 23 | 53 |
| C | 53 | 38 | 0 | 91 |
| Total | 83 | 67 | 64 | 214 |

**Table 7.3 Junction 1: 2023 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 35 | 35 |
| B | 0 | 0 | 0 | 0 |
| C | 22 | 0 | 0 | 22 |
| Total | 22 | 0 | 35 | 57 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 41 | 41 |
| B | 0 | 0 | 0 | 0 |
| C | 54 | 0 | 0 | 54 |
| Total | 54 | 0 | 41 | 95 |

**Table 7.4 Junction 1: 2024 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 32 | 35 | 67 |
| B | 47 | 0 | 76 | 123 |
| C | 22 | 19 | 0 | 41 |
| Total | 69 | 51 | 111 | 231 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 47 | 41 | 89 |
| B | 44 | 0 | 33 | 77 |
| C | 54 | 62 | 0 | 115 |
| Total | 97 | 109 | 75 | 281 |

**Table 7.5 Junction 1: 2024 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 36 | 36 |
| B | 0 | 0 | 0 | 0 |
| C | 22 | 0 | 0 | 22 |
| Total | 22 | 0 | 36 | 58 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 42 | 42 |
| B | 0 | 0 | 0 | 0 |
| C | 55 | 0 | 0 | 55 |
| Total | 55 | 0 | 42 | 97 |

**Table 7.6 Junction 1: 2025 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 42 | 36 | 78 |
| B | 66 | 0 | 107 | 174 |
| C | 22 | 26 | 0 | 48 |
| Total | 88 | 68 | 143 | 299 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 68 | 42 | 110 |
| B | 59 | 0 | 45 | 104 |
| C | 55 | 88 | 0 | 143 |
| Total | 114 | 156 | 87 | 357 |

**Table 7.7 Junction 1: 2025 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 39 | 39 |
| B | 0 | 0 | 0 | 0 |
| C | 24 | 0 | 0 | 24 |
| Total | 24 | 0 | 39 | 63 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 46 | 46 |
| B | 0 | 0 | 0 | 0 |
| C | 60 | 0 | 0 | 60 |
| Total | 60 | 0 | 46 | 106 |

**Table 7.8 Junction 1: 2030 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 15 | 39 | 54 |
| B | 23 | 0 | 38 | 61 |
| C | 24 | 9 | 0 | 33 |
| Total | 47 | 24 | 77 | 148 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 24 | 46 | 70 |
| B | 21 | 0 | 16 | 37 |
| C | 60 | 31 | 0 | 90 |
| Total | 80 | 55 | 62 | 197 |

**Table 7.9 Junction 1: 2030 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 42 | 42 |
| B | 0 | 0 | 0 | 0 |
| C | 26 | 0 | 0 | 26 |
| Total | 26 | 0 | 42 | 68 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 0 | 50 | 50 |
| B | 0 | 0 | 0 | 0 |
| C | 65 | 0 | 0 | 65 |
| Total | 65 | 0 | 50 | 114 |

**Table 7.10 Junction 1: 2040 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 12 | 42 | 54 |
| B | 18 | 0 | 29 | 47 |
| C | 26 | 7 | 0 | 33 |
| Total | 44 | 19 | 71 | 134 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 18 | 50 | 68 |
| B | 16 | 0 | 13 | 29 |
| C | 65 | 24 | 0 | 88 |
| Total | 81 | 42 | 62 | 185 |

**Table 7.11 Junction 1: 2040 With Development AM/PM Peak Hour Traffic Movements**

**Junction 2: Old Whitechurch Rd./ Old Mallow Rd.**

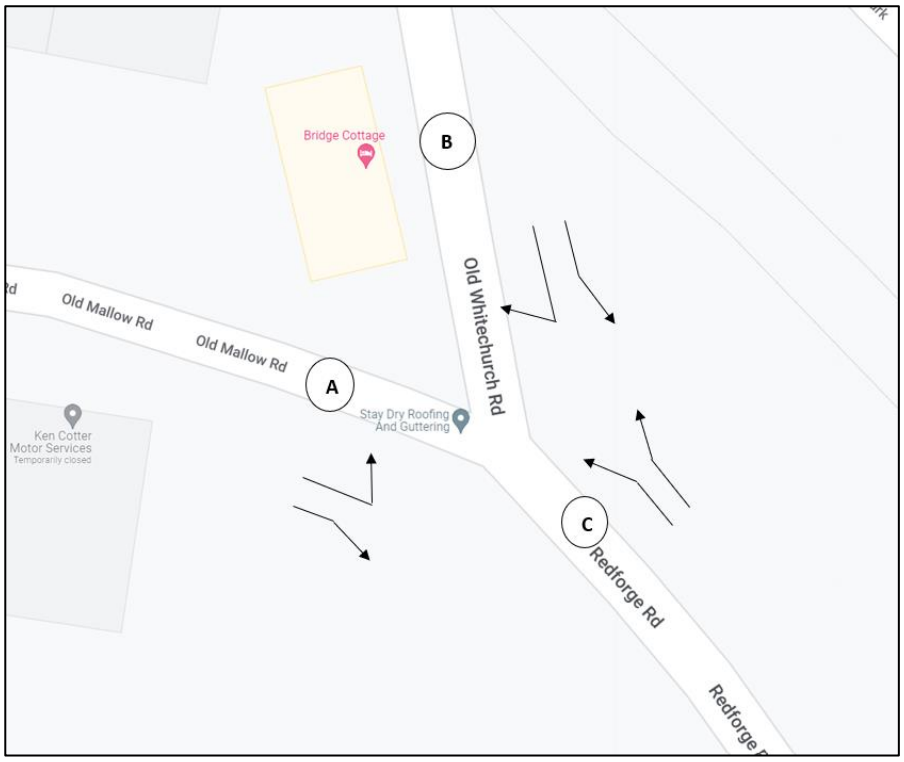


**Figure 7.40: Junction 2 Arm Designation**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 280 | 285 |
| B | 7 | 0 | 27 | 34 |
| C | 230 | 16 | 0 | 246 |
| Total | 237 | 21 | 307 | 565 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 9 | 248 | 257 |
| B | 6 | 0 | 34 | 40 |
| C | 387 | 43 | 0 | 430 |
| Total | 393 | 52 | 282 | 727 |

**Table 7.12 Junction 2: 2022 Existing AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 285 | 290 |
| B | 7 | 0 | 27 | 35 |
| C | 234 | 16 | 0 | 250 |
| Total | 241 | 21 | 312 | 575 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 9 | 252 | 261 |
| B | 6 | 0 | 35 | 41 |
| C | 394 | 44 | 0 | 437 |
| Total | 400 | 53 | 287 | 740 |

**Table 7.13 Junction 2: 2023 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 9 | 285 | 293 |
| B | 17 | 0 | 67 | 84 |
| C | 234 | 27 | 0 | 261 |
| Total | 251 | 36 | 351 | 638 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 16 | 252 | 268 |
| B | 10 | 0 | 54 | 64 |
| C | 394 | 75 | 0 | 469 |
| Total | 403 | 91 | 307 | 800 |

**Table 7.14 Junction 2: 2023 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 290 | 295 |
| B | 7 | 0 | 28 | 35 |
| C | 238 | 17 | 0 | 255 |
| Total | 245 | 22 | 318 | 585 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 9 | 257 | 266 |
| B | 6 | 0 | 35 | 41 |
| C | 400 | 44 | 0 | 445 |
| Total | 407 | 54 | 292 | 752 |

**Table 7.15 Junction 2: 2024 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 10 | 290 | 300 |
| B | 23 | 0 | 88 | 111 |
| C | 238 | 31 | 0 | 269 |
| Total | 261 | 41 | 378 | 680 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 20 | 257 | 277 |
| B | 11 | 0 | 64 | 75 |
| C | 400 | 95 | 0 | 496 |
| Total | 412 | 115 | 320 | 847 |

**Table 7.16 Junction 2: 2024 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 295 | 300 |
| B | 7 | 0 | 28 | 36 |
| C | 242 | 17 | 0 | 259 |
| Total | 249 | 22 | 323 | 595 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 9 | 261 | 271 |
| B | 6 | 0 | 36 | 42 |
| C | 407 | 45 | 0 | 453 |
| Total | 414 | 55 | 297 | 765 |

**Table 7.17 Junction 2: 2025 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 11 | 295 | 306 |
| B | 29 | 0 | 114 | 143 |
| C | 242 | 37 | 0 | 279 |
| Total | 272 | 48 | 408 | 728 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 25 | 261 | 286 |
| B | 13 | 0 | 74 | 87 |
| C | 407 | 118 | 0 | 525 |
| Total | 421 | 143 | 335 | 899 |

**Table 7.18 Junction 2: 2025 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 6 | 321 | 327 |
| B | 8 | 0 | 31 | 39 |
| C | 264 | 18 | 0 | 282 |
| Total | 272 | 24 | 352 | 648 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 10 | 284 | 295 |
| B | 7 | 0 | 39 | 46 |
| C | 444 | 49 | 0 | 493 |
| Total | 451 | 60 | 323 | 834 |

**Table 7.19 Junction 2: 2030 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 8 | 321 | 329 |
| B | 16 | 0 | 61 | 77 |
| C | 264 | 25 | 0 | 289 |
| Total | 280 | 33 | 382 | 695 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 16 | 284 | 300 |
| B | 9 | 0 | 53 | 62 |
| C | 444 | 75 | 0 | 519 |
| Total | 453 | 90 | 337 | 881 |

**Table 7.20 Junction 2: 2030 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 6 | 348 | 354 |
| B | 9 | 0 | 34 | 42 |
| C | 286 | 20 | 0 | 306 |
| Total | 295 | 26 | 382 | 702 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 11 | 308 | 319 |
| B | 7 | 0 | 42 | 50 |
| C | 481 | 53 | 0 | 534 |
| Total | 488 | 65 | 350 | 903 |

**Table 7.21 Junction 2: 2040 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 8 | 348 | 356 |
| B | 15 | 0 | 56 | 71 |
| C | 286 | 25 | 0 | 311 |
| Total | 300 | 33 | 404 | 738 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 15 | 308 | 323 |
| B | 9 | 0 | 53 | 62 |
| C | 481 | 73 | 0 | 554 |
| Total | 490 | 88 | 361 | 940 |

**Table 7.22 Junction 1: 2040 With Development AM/PM Peak Hour Traffic Movements**

**Junction 3: Redforge Rd./ Dublin Hill Rd.**

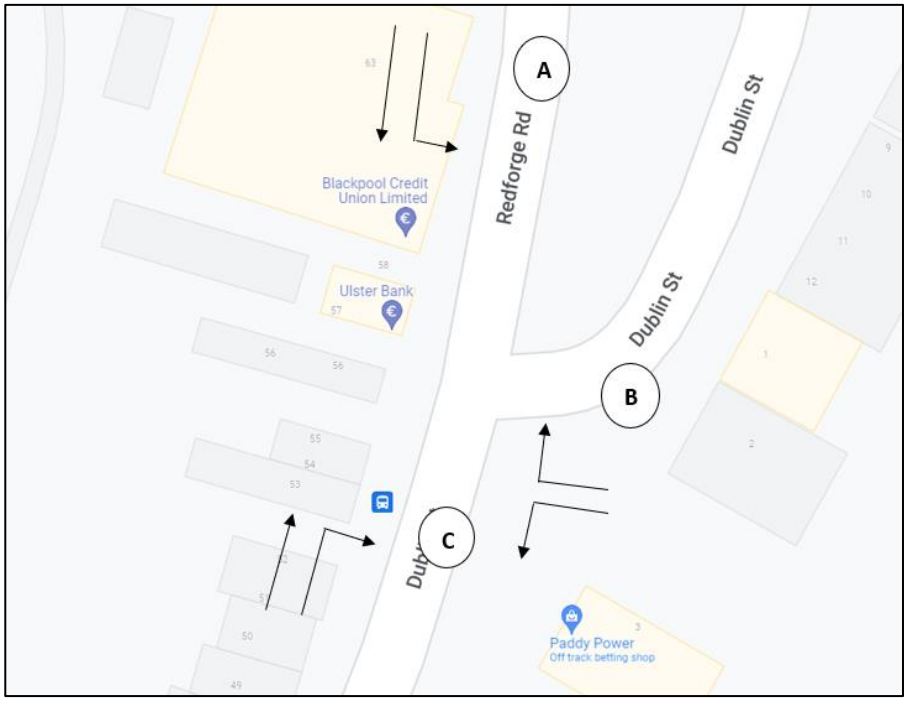


**Figure 7.41: Junction 3 Arm Designation**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 194 | 170 | 364 |
| B | 367 | 0 | 438 | 805 |
| C | 168 | 159 | 0 | 327 |
| Total | 535 | 353 | 608 | 1496 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 311 | 209 | 520 |
| B | 281 | 0 | 237 | 518 |
| C | 217 | 224 | 0 | 441 |
| Total | 498 | 535 | 446 | 1479 |

**Table 7.23 Junction 3: 2022 Existing AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 197 | 173 | 370 |
| B | 373 | 0 | 446 | 819 |
| C | 171 | 162 | 0 | 333 |
| Total | 544 | 359 | 619 | 1522 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 316 | 213 | 529 |
| B | 286 | 0 | 241 | 527 |
| C | 221 | 228 | 0 | 449 |
| Total | 507 | 544 | 454 | 1505 |

**Table 7.24 Junction 3: 2023 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 218 | 191 | 409 |
| B | 381 | 0 | 446 | 826 |
| C | 174 | 162 | 0 | 336 |
| Total | 555 | 380 | 637 | 1572 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 328 | 221 | 549 |
| B | 303 | 0 | 241 | 545 |
| C | 234 | 228 | 0 | 462 |
| Total | 538 | 556 | 462 | 1555 |

**Table 7.25 Junction 3: 2023 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 201 | 176 | 377 |
| B | 380 | 0 | 453 | 833 |
| C | 174 | 165 | 0 | 338 |
| Total | 554 | 365 | 629 | 1548 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 322 | 216 | 538 |
| B | 291 | 0 | 245 | 536 |
| C | 225 | 232 | 0 | 456 |
| Total | 515 | 554 | 462 | 1531 |

**Table 7.26 Junction 3: 2024 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 233 | 204 | 437 |
| B | 390 | 0 | 453 | 843 |
| C | 179 | 165 | 0 | 343 |
| Total | 569 | 397 | 657 | 1623 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 339 | 228 | 567 |
| B | 320 | 0 | 245 | 565 |
| C | 247 | 232 | 0 | 479 |
| Total | 566 | 571 | 473 | 1610 |

**Table 7.27 Junction 3: 2024 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 204 | 179 | 383 |
| B | 386 | 0 | 461 | 847 |
| C | 177 | 167 | 0 | 344 |
| Total | 563 | 372 | 640 | 1575 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 327 | 220 | 547 |
| B | 296 | 0 | 249 | 545 |
| C | 228 | 236 | 0 | 464 |
| Total | 524 | 563 | 470 | 1557 |

**Table 7.28 Junction 3: 2025 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 250 | 219 | 468 |
| B | 400 | 0 | 461 | 861 |
| C | 183 | 167 | 0 | 350 |
| Total | 583 | 417 | 680 | 1680 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 350 | 236 | 586 |
| B | 337 | 0 | 249 | 586 |
| C | 260 | 236 | 0 | 496 |
| Total | 597 | 586 | 485 | 1668 |

**Table 7.29 Junction 3: 2025 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 223 | 195 | 418 |
| B | 421 | 0 | 502 | 923 |
| C | 193 | 182 | 0 | 375 |
| Total | 614 | 405 | 697 | 1716 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 357 | 240 | 596 |
| B | 322 | 0 | 272 | 594 |
| C | 249 | 257 | 0 | 506 |
| Total | 571 | 614 | 512 | 1696 |

**Table 7.30 Junction 3: 2030 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 223 | 225 | 447 |
| B | 421 | 0 | 582 | 1003 |
| C | 200 | 195 | 0 | 395 |
| Total | 621 | 418 | 807 | 1845 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 357 | 253 | 610 |
| B | 322 | 0 | 300 | 622 |
| C | 274 | 316 | 0 | 591 |
| Total | 597 | 673 | 553 | 1823 |

**Table 7.31 Junction 3: 2030 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 241 | 211 | 452 |
| B | 456 | 0 | 544 | 1000 |
| C | 209 | 198 | 0 | 406 |
| Total | 665 | 439 | 756 | 1859 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 386 | 260 | 646 |
| B | 349 | 0 | 295 | 644 |
| C | 270 | 278 | 0 | 548 |
| Total | 619 | 665 | 554 | 1838 |

**Table 7.32 Junction 3: 2040 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 241 | 234 | 475 |
| B | 456 | 0 | 605 | 1061 |
| C | 214 | 208 | 0 | 422 |
| Total | 670 | 449 | 840 | 1959 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 386 | 270 | 657 |
| B | 349 | 0 | 317 | 666 |
| C | 289 | 324 | 0 | 613 |
| Total | 638 | 710 | 587 | 1936 |

**Table 7.33 Junction 1: 2040 With Development AM/PM Peak Hour Traffic Movements**

**Junction 4: Kilbarry Enterprise Centre Rd./ Upper Dublin Hill.**

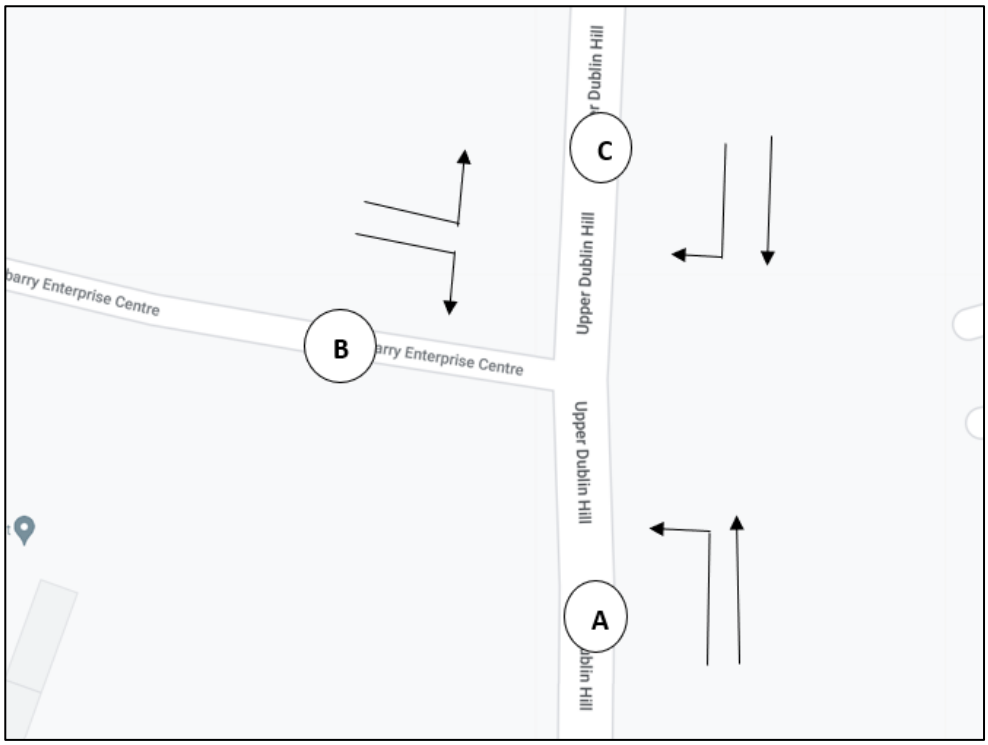


**Figure 7.42: Junction 4 Arm Designation**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 269 | 272 |
| B | 6 | 0 | 3 | 9 |
| C | 639 | 6 | 0 | 645 |
| Total | 645 | 9 | 272 | 926 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 482 | 487 |
| B | 3 | 0 | 5 | 8 |
| C | 340 | 3 | 0 | 343 |
| Total | 343 | 8 | 487 | 839 |

**Table 7.34 Junction 4: 2022 Existing AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 274 | 276 |
| B | 7 | 0 | 3 | 9 |
| C | 650 | 7 | 0 | 657 |
| Total | 657 | 9 | 276 | 942 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 490 | 495 |
| B | 3 | 0 | 5 | 8 |
| C | 346 | 3 | 0 | 349 |
| Total | 349 | 8 | 495 | 853 |

**Table 7.35 Junction 4: 2023 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 294 | 297 |
| B | 7 | 0 | 3 | 9 |
| C | 658 | 7 | 0 | 664 |
| Total | 664 | 9 | 297 | 971 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 502 | 507 |
| B | 3 | 0 | 5 | 8 |
| C | 364 | 3 | 0 | 367 |
| Total | 367 | 8 | 507 | 882 |

**Table 7.36 Junction 4: 2023 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 278 | 281 |
| B | 7 | 0 | 3 | 9 |
| C | 661 | 7 | 0 | 668 |
| Total | 668 | 9 | 281 | 959 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 499 | 504 |
| B | 4 | 0 | 5 | 9 |
| C | 352 | 4 | 0 | 355 |
| Total | 355 | 9 | 504 | 868 |

**Table 7.37 Junction 4: 2024 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 310 | 313 |
| B | 7 | 0 | 3 | 9 |
| C | 671 | 7 | 0 | 678 |
| Total | 678 | 9 | 313 | 1001 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 516 | 521 |
| B | 4 | 0 | 5 | 9 |
| C | 381 | 4 | 0 | 384 |
| Total | 384 | 9 | 521 | 914 |

**Table 7.38 Junction 4: 2024 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 283 | 286 |
| B | 7 | 0 | 3 | 10 |
| C | 673 | 7 | 0 | 679 |
| Total | 679 | 10 | 286 | 975 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 507 | 513 |
| B | 4 | 0 | 5 | 9 |
| C | 358 | 4 | 0 | 362 |
| Total | 362 | 9 | 513 | 883 |

**Table 7.39 Junction 4: 2025 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 317 | 320 |
| B | 7 | 0 | 3 | 10 |
| C | 686 | 7 | 0 | 693 |
| Total | 693 | 10 | 320 | 1022 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 5 | 530 | 536 |
| B | 4 | 0 | 5 | 9 |
| C | 399 | 4 | 0 | 403 |
| Total | 403 | 9 | 536 | 947 |

**Table 7.40 Junction 4: 2025 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 309 | 312 |
| B | 7 | 0 | 3 | 11 |
| C | 733 | 7 | 0 | 740 |
| Total | 740 | 11 | 312 | 1063 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 6 | 553 | 558 |
| B | 4 | 0 | 6 | 10 |
| C | 390 | 4 | 0 | 394 |
| Total | 394 | 10 | 558 | 962 |

**Table 7.41 Junction 4: 2030 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 16 | 309 | 325 |
| B | 87 | 0 | 37 | 123 |
| C | 733 | 38 | 0 | 771 |
| Total | 820 | 55 | 345 | 1219 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 65 | 553 | 618 |
| B | 32 | 0 | 45 | 77 |
| C | 390 | 46 | 0 | 436 |
| Total | 422 | 111 | 598 | 1131 |

**Table 7.42 Junction 4: 2030 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 3 | 334 | 338 |
| B | 8 | 0 | 3 | 11 |
| C | 794 | 8 | 0 | 802 |
| Total | 802 | 11 | 338 | 1151 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 6 | 599 | 605 |
| B | 4 | 0 | 6 | 10 |
| C | 423 | 4 | 0 | 427 |
| Total | 427 | 10 | 605 | 1042 |

**Table 7.43 Junction 4: 2040 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 14 | 334 | 348 |
| B | 69 | 0 | 29 | 98 |
| C | 794 | 33 | 0 | 827 |
| Total | 863 | 47 | 363 | 1273 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 51 | 599 | 650 |
| B | 27 | 0 | 38 | 64 |
| C | 423 | 36 | 0 | 459 |
| Total | 449 | 88 | 637 | 1173 |

**Table 7.44 Junction 4: 2040 With Development AM/PM Peak Hour Traffic Movements**

**Junction 5: Upper Dublin Hill/ Lower Dublin Hill**


**Figure 7.43: Junction 5 Arm Designation**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 194 | 486 | 680 |
| B | 135 | 0 | 159 | 294 |
| C | 185 | 87 | 0 | 272 |
| Total | 320 | 281 | 645 | 1246 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 142 | 235 | 377 |
| B | 184 | 0 | 108 | 292 |
| C | 340 | 147 | 0 | 487 |
| Total | 524 | 289 | 343 | 1156 |

**Table 7.45 Junction 5: 2022 Existing AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 197 | 494 | 692 |
| B | 137 | 0 | 162 | 299 |
| C | 188 | 89 | 0 | 277 |
| Total | 326 | 286 | 656 | 1268 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 144 | 239 | 384 |
| B | 187 | 0 | 110 | 297 |
| C | 346 | 150 | 0 | 495 |
| Total | 533 | 294 | 349 | 1176 |

**Table 7.46 Junction 5: 2023 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 197 | 500 | 697 |
| B | 137 | 0 | 164 | 301 |
| C | 202 | 95 | 0 | 298 |
| Total | 340 | 293 | 664 | 1296 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 144 | 251 | 396 |
| B | 187 | 0 | 115 | 303 |
| C | 354 | 153 | 0 | 507 |
| Total | 541 | 298 | 367 | 1205 |

**Table 7.47 Junction 5: 2023 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 201 | 503 | 704 |
| B | 140 | 0 | 165 | 304 |
| C | 191 | 90 | 0 | 281 |
| Total | 331 | 291 | 667 | 1289 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 147 | 243 | 390 |
| B | 190 | 0 | 112 | 302 |
| C | 352 | 152 | 0 | 504 |
| Total | 542 | 299 | 355 | 1196 |

**Table 7.48 Junction 5: 2024 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 201 | 511 | 711 |
| B | 140 | 0 | 167 | 307 |
| C | 213 | 100 | 0 | 314 |
| Total | 353 | 301 | 678 | 1332 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 147 | 263 | 410 |
| B | 190 | 0 | 121 | 311 |
| C | 364 | 157 | 0 | 521 |
| Total | 554 | 304 | 384 | 1242 |

**Table 7.49 Junction 5: 2024 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 204 | 512 | 716 |
| B | 142 | 0 | 167 | 310 |
| C | 195 | 92 | 0 | 286 |
| Total | 337 | 296 | 679 | 1312 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 149 | 247 | 397 |
| B | 194 | 0 | 114 | 307 |
| C | 358 | 155 | 0 | 513 |
| Total | 552 | 304 | 361 | 1217 |

**Table 7.50 Junction 5: 2025 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 204 | 522 | 726 |
| B | 142 | 0 | 171 | 313 |
| C | 218 | 102 | 0 | 320 |
| Total | 360 | 307 | 693 | 1359 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 149 | 276 | 425 |
| B | 194 | 0 | 127 | 320 |
| C | 374 | 162 | 0 | 536 |
| Total | 568 | 311 | 402 | 1281 |

**Table 7.51 Junction 5: 2025 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 223 | 557 | 780 |
| B | 155 | 0 | 182 | 337 |
| C | 212 | 100 | 0 | 312 |
| Total | 367 | 322 | 740 | 1429 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 163 | 270 | 432 |
| B | 211 | 0 | 124 | 335 |
| C | 390 | 169 | 0 | 559 |
| Total | 601 | 331 | 393 | 1326 |

**Table 7.52 Junction 5: 2030 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 223 | 581 | 803 |
| B | 155 | 0 | 190 | 345 |
| C | 235 | 110 | 0 | 345 |
| Total | 390 | 333 | 771 | 1494 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 163 | 298 | 461 |
| B | 211 | 0 | 137 | 348 |
| C | 418 | 181 | 0 | 598 |
| Total | 629 | 343 | 435 | 1408 |

**Table 7.53 Junction 5: 2030 With Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 241 | 604 | 845 |
| B | 168 | 0 | 198 | 365 |
| C | 230 | 108 | 0 | 338 |
| Total | 398 | 349 | 802 | 1548 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 176 | 292 | 468 |
| B | 229 | 0 | 134 | 363 |
| C | 423 | 183 | 0 | 605 |
| Total | 651 | 359 | 426 | 1437 |

**Table 7.54 Junction 5: 2040 Without Development AM/PM Peak Hour Traffic Movements**

*AM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 241 | 623 | 864 |
| B | 168 | 0 | 204 | 372 |
| C | 247 | 116 | 0 | 364 |
| Total | 415 | 357 | 827 | 1599 |

*PM*

| Origin \ Destination | A | B | C | Tot |
|---|---|---|---|---|
| A | 0 | 176 | 314 | 490 |
| B | 229 | 0 | 144 | 373 |
| C | 445 | 192 | 0 | 637 |
| Total | 673 | 369 | 458 | 1500 |

**Table 7.55 Junction 5: 2040 With Development AM/PM Peak Hour Traffic Movements**

**Network Modelling Results**

This section presents the results of the traffic modelling of the five identified junctions presented both with/without development in place for both morning and evening peaks, for each phase of the development as it becomes occupied. The current year (2022) results are based on traffic surveys completed on 5th April 2022 and are representative of how each junction currently operates during peak periods.

Of the five identified junctions, the junctions identified as 1,4, and 5, are priority T-junctions with the remaining two, identified as junctions 2 and 3, being signalised. Traffic Signal controlled junctions are analysed using LinSig Version 3.3 and priority-controlled junctions are analysed using Junctions 9 Software (PICADY).

The Junctions 9: PICADY modelling software produces an RFC % (Ratio of Flow to Capacity), a Delay figure measured in seconds and a LOS (Level of Service) which are used to compare the effects the development will have on the junction being modelled. An RFC of 85% on a roundabout junction implies that the junction has reached capacity but is still operational with delay incurred. The following table describes the different LOS and the implications for the junction being assessed.

| | |
|---|---|
| Level of Service A | Free-Flow |
| Level of Service B | Reasonably Free-Flow (no delay incurred) |
| Level of Service C | Stable Operation (busy but operational with acceptable delay incurred) |
| Level of Service D | Borderline Unstable (Junctions reaching capacity – but still operational- delay incurred) |
| Level of Service E | Extremely Unstable (Junctions at capacity or over, any incident will cause a grid-lock situation- significant delay incurred) |
| Level of Service F | Breakdown (Junctions over capacity, unacceptable delay traffic at a standstill) |

**Figure 7.44: Level of Service**

The LinSig modelling software produces a PRC % (Practical Reserve Capacity) and a Delay figure which are used to compare the effects the development will have on the junction being modelled. A PRC of 10% implies that the junction has reached capacity but is still operational with delay incurred. The delay figure produced (pcuHr) is a measure of the overall delay incurred on all arms of the junction and is based on the Demand Flow per arm multiplied by the Average Delay per PCU.

**Junction 1: Access Road junction with Old Whitechurch Road**

The Junctions 9: PICADY results for the junction both with/without development are presented in the table below.

| | AM | | | | | | | PM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Junction LOS | Network Residual Capacity | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Junction LOS | Network Residual Capacity |
| | 2022 | | | | | | | | | | | | | |
| Stream B-AC | D1 | 0.0 | 0.00 | 0.00 | A | A | 900 % | D2 | 0.0 | 0.00 | 0.00 | A | A | 900 % |
| Stream C-AB | | 0.0 | 0.00 | 0.00 | A | | [] | | 0.0 | 0.00 | 0.00 | A | | [] |
| | 2023 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D3 | 0.0 | 0.00 | 0.00 | A | A | 900 % | D4 | 0.0 | 0.00 | 0.00 | A | A | 900 % |
| Stream C-AB | | 0.0 | 0.00 | 0.00 | A | | [] | | 0.0 | 0.00 | 0.00 | A | | [] |
| | 2023 With Development | | | | | | | | | | | | | |
| Stream B-AC | D5 | 0.2 | 8.15 | 0.16 | A | A | 335 % | D6 | 0.1 | 8.27 | 0.12 | A | A | 378 % |
| Stream C-AB | | 0.0 | 6.63 | 0.03 | A | | [Stream B-AC] | | 0.1 | 6.74 | 0.08 | A | | [Stream B-AC] |
| | 2024 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D7 | 0.0 | 0.00 | 0.00 | A | A | 900 % | D8 | 0.0 | 0.00 | 0.00 | A | A | 900 % |
| Stream C-AB | | 0.0 | 0.00 | 0.00 | A | | [] | | 0.0 | 0.00 | 0.00 | A | | [] |
| | 2024 With Development | | | | | | | | | | | | | |
| Stream B-AC | D9 | 0.3 | 9.20 | 0.26 | A | A | 192 % | D10 | 0.2 | 9.00 | 0.17 | A | A | 242 % |
| Stream C-AB | | 0.0 | 6.72 | 0.04 | A | | [Stream B-AC] | | 0.2 | 7.19 | 0.13 | A | | [Stream B-AC] |
| | 2025 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D11 | 0.0 | 0.00 | 0.00 | A | A | 900 % | D12 | 0.0 | 0.00 | 0.00 | A | A | 900 % |
| Stream C-AB | | 0.0 | 0.00 | 0.00 | A | | [] | | 0.0 | 0.00 | 0.00 | A | | [] |
| | 2025 With Development | | | | | | | | | | | | | |
| Stream B-AC | D13 | 0.6 | 10.79 | 0.36 | B | A | 112 % | D14 | 0.3 | 9.95 | 0.24 | A | A | 160 % |
| Stream C-AB | | 0.1 | 6.86 | 0.05 | A | | [Stream B-AC] | | 0.3 | 7.76 | 0.19 | A | | [Stream B-AC] |
| | 2030 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D15 | 0.0 | 0.00 | 0.00 | A | A | 900 % | D16 | 0.0 | 0.00 | 0.00 | A | A | 900 % |
| Stream C-AB | | 0.0 | 0.00 | 0.00 | A | | [] | | 0.0 | 0.00 | 0.00 | A | | [] |
| | 2030 With Development | | | | | | | | | | | | | |
| Stream B-AC | D17 | 0.1 | 7.78 | 0.13 | A | A | 442 % | D18 | 0.1 | 7.95 | 0.08 | A | A | 494 % |
| Stream C-AB | | 0.0 | 6.52 | 0.02 | A | | [Stream B-AC] | | 0.1 | 6.58 | 0.07 | A | | [Stream B-AC] |
| | 2040 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D19 | 0.0 | 0.00 | 0.00 | A | A | 900 % | D20 | 0.0 | 0.00 | 0.00 | A | A | 900 % |
| Stream C-AB | | 0.0 | 0.00 | 0.00 | A | | [] | | 0.0 | 0.00 | 0.00 | A | | [] |
| | 2040 With Development | | | | | | | | | | | | | |
| Stream B-AC | D21 | 0.1 | 7.55 | 0.10 | A | A | 562 % | D22 | 0.1 | 7.75 | 0.06 | A | A | 590 % |
| Stream C-AB | | 0.0 | 6.48 | 0.01 | A | | [Stream B-AC] | | 0.1 | 6.43 | 0.05 | A | | [Stream B-AC] |

**Figure 7.45: Junction 1 – PICADY Results**

The results indicate that the junction currently operates within capacity for both AM & PM peak at a Level of Service A – Free Flow. For the purposes of modelling the "Without Development" future year scenarios, it is assumed that no traffic will travel via the existing minor road which would serve as the development access road when the development is occupied.

Future year results, with the development traffic included, show an increasing RFC% (Ratio of Glow to Capacity) as the different phases are introduced. A maximum AM and PM RFC% result, of 36% and 24% respectively, is shown in 2025 when all three phases of the development are added. The RFC% can be seen to decrease in the future year scenarios 2030 and 2040 as traffic is siphoned away from this junction and onto the Kilbarry

Enterprise Centre Rd./ Upper Dublin Hill (Junction 4). The junction operates with a Level of Service A – Free Flow for all modelled scenarios.

**Junction 2: Old Whitechurch Rd./ Old Mallow Rd.**

The LinSig results for Junction 2 with and without development traffic are presented in table below.

| Junction 2: Old Whitechurch Rd./ Old Mallow Rd. | | No Development | | | With Development | | |
|---|---|---|---|---|---|---|---|
| | | Cycle Time (s) | PRC (%) | Delay (pcu/hr) | Cycle Time (s) | PRC (%) | Delay (pcu/hr) |
| 2022 | AM | 90 | 162.1 | 3.56 | 90 | N/A | N/A |
| | PM | 90 | 103.9 | 4.59 | 90 | N/A | N/A |
| 2023 | AM | 90 | 157.9 | 3.63 | 90 | 153.6 | 4.05 |
| | PM | 90 | 100.7 | 4.39 | 90 | 89.0 | 5.08 |
| 2024 | AM | 90 | 152.9 | 3.71 | 90 | 147.2 | 4.34 |
| | PM | 90 | 97.0 | 4.79 | 90 | 81.9 | 5.40 |
| 2025 | AM | 90 | 149.0 | 3.78 | 90 | 138.3 | 4.69 |
| | PM | 90 | 94.0 | 4.89 | 90 | 72.7 | 5.79 |
| 2030 | AM | 90 | 128.7 | 4.21 | 90 | 126.6 | 4.51 |
| | PM | 90 | 78.2 | 5.50 | 90 | 70.8 | 5.84 |
| 2040 | AM | 90 | 110.7 | 4.66 | 90 | 109.4 | 4.88 |
| | PM | 90 | 64.2 | 6.15 | 90 | 60.0 | 6.43 |

**Figure 7.46: Junction 2 – LinSig Results**

The results indicate that the junction will operate within capacity during both AM & PM peak for all future years both with and without development traffic.

**Junction 3: Redforge Rd./ Dublin Hill**

The LinSig results for Junction 3 both with and without development traffic are presented in below table.

| Junction 3: Redforge Rd./ Dublin St. | | No Development | | | With Development | | |
|---|---|---|---|---|---|---|---|
| | | Cycle Time (s) | PRC (%) | Delay (pcu/hr) | Cycle Time (s) | PRC (%) | Delay (pcu/hr) |
| 2022 | AM | 90 | 43.1 | 12.60 | 90 | N/A | N/A |
| | PM | 90 | 19.7 | 15.00 | 90 | N/A | N/A |
| 2023 | AM | 90 | 40.5 | 13.10 | 90 | 32.9 | 14.00 |
| | PM | 90 | 16.5 | 15.93 | 90 | 10.5 | 17.72 |
| 2024 | AM | 90 | 36.8 | 13.52 | 90 | 25.0 | 15.01 |
| | PM | 90 | 13.3 | 16.67 | 90 | 4.2 | 20.75 |
| 2025 | AM | 90 | 32.6 | 13.96 | 90 | 17.2 | 16.34 |
| | PM | 90 | 9.9 | 17.81 | 90 | -1.2 | 25.58 |
| 2030 | AM | 90 | 20.1 | 16.67 | 90 | 11.3 | 19.06 |
| | PM | 90 | -2.1 | 25.92 | 90 | -12.6 | 50.46 |
| 2040 | AM | 90 | 6.9 | 20.52 | 90 | 2.8 | 23.23 |
| | PM | 90 | -14.8 | 58.31 | 90 | -20.8 | 87.70 |

**Figure 7.47: Junction 3: LinSig results**

The results indicate that the junction will reach capacity in 2025 during the PM peak with no additional development traffic applied. When development traffic is included, the junction instead reaches capacity in 2024 during the PM Peak and is shown to exceed capacity during the PM Peak in 2025. The junction can be seen to continue degrading and exceeds capacity both with and without development traffic for the design years 2030 and 2040.

**Junction 4: Kilbarry Enterprise Centre Rd./ Upper Dublin Hill**

The PICADY results for Junction 4 both with and without development traffic are presented in table below.

The results indicate that the junction currently operates within capacity for both AM & PM peak at a Level of Service A – Free Flow.

| | AM | | | | | | | PM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Junction LOS | Network Residual Capacity | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Junction LOS | Network Residual Capacity |
| | 2022 | | | | | | | | | | | | | |
| Stream B-AC | D1 | 0.0 | 8.24 | 0.02 | A | A | 136 % | D2 | 0.0 | 7.61 | 0.02 | A | A | 179 % |
| Stream C-AB | | 0.0 | 4.04 | 0.02 | A | | [Stream C-AB] | | 0.0 | 5.01 | 0.01 | A | | [Stream B-AC] |
| | 2023 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D3 | 0.0 | 8.45 | 0.03 | A | A | 130 % | D4 | 0.0 | 7.66 | 0.02 | A | A | 175 % |
| Stream C-AB | | 0.0 | 4.02 | 0.02 | A | | [Stream C-AB] | | 0.0 | 5.00 | 0.01 | A | | [Stream B-AC] |
| | 2023 With Development | | | | | | | | | | | | | |
| Stream B-AC | D5 | 0.0 | 8.58 | 0.03 | A | A | 127 % | D6 | 0.0 | 7.74 | 0.02 | A | A | 167 % |
| Stream C-AB | | 0.0 | 4.01 | 0.02 | A | | [Stream C-AB] | | 0.0 | 4.95 | 0.01 | A | | [Stream B-AC] |
| | 2024 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D7 | 0.0 | 8.50 | 0.03 | A | A | 127 % | D8 | 0.0 | 7.95 | 0.02 | A | A | 164 % |
| Stream C-AB | | 0.0 | 4.00 | 0.02 | A | | [Stream C-AB] | | 0.0 | 5.00 | 0.01 | A | | [Stream B-AC] |
| | 2024 With Development | | | | | | | | | | | | | |
| Stream B-AC | D9 | 0.0 | 8.71 | 0.03 | A | A | 123 % | D10 | 0.0 | 8.09 | 0.02 | A | A | 153 % |
| Stream C-AB | | 0.0 | 3.99 | 0.02 | A | | [Stream C-AB] | | 0.0 | 4.91 | 0.01 | A | | [Stream B-AC] |
| | 2025 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D11 | 0.0 | 8.56 | 0.03 | A | A | 123 % | D12 | 0.0 | 8.00 | 0.02 | A | A | 160 % |
| Stream C-AB | | 0.0 | 3.97 | 0.02 | A | | [Stream C-AB] | | 0.0 | 4.98 | 0.01 | A | | [Stream B-AC] |
| | 2025 With Development | | | | | | | | | | | | | |
| Stream B-AC | D13 | 0.0 | 8.79 | 0.03 | A | A | 118 % | D14 | 0.0 | 8.20 | 0.02 | A | A | 145 % |
| Stream C-AB | | 0.0 | 3.97 | 0.02 | A | | [Stream C-AB] | | 0.0 | 4.86 | 0.01 | A | | [Stream B-AC] |
| | 2030 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D15 | 0.0 | 8.90 | 0.03 | A | A | 105 % | D16 | 0.0 | 8.16 | 0.02 | A | A | 141 % |
| Stream C-AB | | 0.0 | 3.86 | 0.03 | A | | [Stream C-AB] | | 0.0 | 4.91 | 0.01 | A | | [Stream B-AC] |
| | 2030 With Development | | | | | | | | | | | | | |
| Stream B-AC | D17 | 0.5 | 13.49 | 0.34 | B | A | 47 % | D18 | 0.2 | 10.36 | 0.20 | B | A | 77 % |
| Stream C-AB | | 0.4 | 4.12 | 0.14 | A | | [Stream B-AC] | | 0.3 | 5.37 | 0.14 | A | | [Stream B-AC] |
| | 2040 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D19 | 0.0 | 9.42 | 0.03 | A | A | 89 % | D20 | 0.0 | 8.47 | 0.03 | A | A | 123 % |
| Stream C-AB | | 0.0 | 3.76 | 0.03 | A | | [Stream C-AB] | | 0.0 | 4.84 | 0.01 | A | | [Stream B-AC] |
| | 2040 With Development | | | | | | | | | | | | | |
| Stream B-AC | D21 | 0.4 | 12.81 | 0.28 | B | A | 52 % | D22 | 0.2 | 10.33 | 0.17 | B | A | 76 % |
| Stream C-AB | | 0.3 | 3.97 | 0.14 | A | | [Stream B-AC] | | 0.3 | 5.18 | 0.12 | A | | [Stream B-AC] |

**Figure 7.48: Junction 4: PICADY results**

Future year results, with and without the development traffic included, show a gradual increase in RFC% (Ratio of Glow to Capacity) up to design year 2040. Design years 2030 & 2040 include a portion of the development

traffic accessing Upper Dublin Hill via the Kilbarry Enterprise Centre Rd. link. It is not anticipated that the connection between the Development Distributor Road and the Kilbarry Enterprise Centre Rd. will be open for the modelled scenario year 2025. In accordance, a maximum AM and PM RFC% result, of 34% and 20% respectively, is shown in 2030. The reduction in the RFC% in 2040 is the result of anticipated modal shift to more sustainable modes of travel upon the completion of the Northern Distributor Road and improved available public travel facilities prior to 2040. The junction is shown to operate with a Level of Service A – Free Flow for all modelled scenarios.

**Junction 5: Upper Dublin Hill/ Lower Dublin Hill**

The PICADY results for Junction 5 both with and without development traffic are presented in below table.

The results indicate that the junction currently operates within capacity for both AM & PM peak at a Level of Service A – Free Flow.

| | AM | | | | | | | PM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Junction LOS | Network Residual Capacity | Set ID | Queue (Veh) | Delay (s) | RFC | LOS | Junction LOS | Network Residual Capacity |
| | 2022 | | | | | | | | | | | | | |
| Stream B-AC | D1 | 1.9 | 21.70 | 0.66 | C | A | 12 % | D2 | 1.8 | 20.83 | 0.65 | C | A | 14 % |
| Stream C-AB | | 0.4 | 7.47 | 0.23 | A | | [Stream B-AC] | | 0.9 | 7.15 | 0.38 | A | | [Stream B-AC] |
| | 2023 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D3 | 2.0 | 22.93 | 0.68 | C | A | 10 % | D4 | 1.9 | 21.94 | 0.67 | C | A | 12 % |
| Stream C-AB | | 0.4 | 7.54 | 0.24 | A | | [Stream B-AC] | | 0.9 | 7.25 | 0.39 | A | | [Stream B-AC] |
| | 2023 With Development | | | | | | | | | | | | | |
| Stream B-AC | D5 | 2.1 | 23.96 | 0.69 | C | A | 9 % | D6 | 2.1 | 23.21 | 0.68 | C | A | 10 % |
| Stream C-AB | | 0.5 | 7.62 | 0.25 | A | | [Stream B-AC] | | 1.0 | 7.37 | 0.40 | A | | [Stream B-AC] |
| | 2024 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D7 | 2.2 | 24.56 | 0.70 | C | A | 8 % | D8 | 2.1 | 23.13 | 0.68 | C | A | 10 % |
| Stream C-AB | | 0.4 | 7.59 | 0.24 | A | | [Stream B-AC] | | 1.0 | 7.32 | 0.39 | A | | [Stream B-AC] |
| | 2024 With Development | | | | | | | | | | | | | |
| Stream B-AC | D9 | 2.4 | 26.25 | 0.71 | D | A | 6 % | D10 | 2.4 | 25.64 | 0.71 | D | A | 7 % |
| Stream C-AB | | 0.5 | 7.73 | 0.27 | A | | [Stream B-AC] | | 1.1 | 7.54 | 0.41 | A | | [Stream B-AC] |
| | 2025 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D11 | 2.4 | 26.06 | 0.71 | D | A | 6 % | D12 | 2.2 | 24.72 | 0.70 | C | A | 8 % |
| Stream C-AB | | 0.5 | 7.66 | 0.25 | A | | [Stream B-AC] | | 1.0 | 7.43 | 0.40 | A | | [Stream B-AC] |
| | 2025 With Development | | | | | | | | | | | | | |
| Stream B-AC | D13 | 2.6 | 28.48 | 0.73 | D | A | 4 % | D14 | 2.7 | 29.06 | 0.74 | D | A | 4 % |
| Stream C-AB | | 0.6 | 7.81 | 0.28 | A | | [Stream B-AC] | | 1.2 | 7.76 | 0.43 | A | | [Stream B-AC] |
| | 2030 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D15 | 3.9 | 40.27 | 0.81 | E | B | -2 % | D16 | 3.5 | 36.33 | 0.79 | E | B | -1 % |
| Stream C-AB | | 0.6 | 8.03 | 0.28 | A | | [Stream B-AC] | | 1.3 | 8.05 | 0.46 | A | | [Stream B-AC] |
| | 2030 With Development | | | | | | | | | | | | | |
| Stream B-AC | D17 | 4.9 | 50.10 | 0.85 | F | B | -5 % | D18 | 4.7 | 47.78 | 0.85 | E | B | -5 % |
| Stream C-AB | | 0.7 | 8.30 | 0.32 | A | | [Stream B-AC] | | 1.7 | 8.75 | 0.51 | A | | [Stream B-AC] |
| | 2040 Without Development | | | | | | | | | | | | | |
| Stream B-AC | D19 | 8.1 | 77.46 | 0.93 | F | C | -10 % | D20 | 6.6 | 63.94 | 0.90 | F | C | -8 % |
| Stream C-AB | | 0.7 | 8.47 | 0.32 | A | | [Stream B-AC] | | 1.7 | 8.91 | 0.52 | A | | [Stream B-AC] |
| | 2040 With Development | | | | | | | | | | | | | |
| Stream B-AC | D21 | 10.5 | 97.10 | 0.96 | F | C | -12 % | D22 | 9.2 | 85.44 | 0.94 | F | C | -11 % |
| Stream C-AB | | 0.8 | 8.76 | 0.35 | A | | [Stream B-AC] | | 2.1 | 9.65 | 0.57 | A | | [Stream B-AC] |

**Figure 7.49: Junction 5: PICADY results**

Future year results, with and without the development traffic included, show a gradual increase in RFC% (Ratio of Glow to Capacity) up to design year 2040. The junction is shown to operate, both with and without development traffic, with a Level of Service B – Reasonably Free Flow (no delay incurred) in design year 2030, and a Level of Service C - Stable Operation (busy but operational with acceptable delay incurred) in design year 2040.

## 7.5 Mitigation measures and Residual Impacts

### 7.5.1 Mitigation

**Construction Phase**

The following mitigation measures are proposed to minimise the impact of construction traffic.

- The re-use of excavated materials generated on-site will reduce the total volume of imported material thereby reducing traffic generation.
- Adequate storage space on site will be provided to accommodate all cut material.
- Defining delivery times to site will avoid background traffic peak periods. Trucks will be equipped with dust covers when carrying dust producing materials to reduce the environmental impact of this activity.
- Construction stage site staff starting at 07:00 and ending at 18:00 will avoid the recorded peak periods.
- Site Staff encouraged to car-pool and to use public transport.
- Road cleaning and wheel-wash systems will be put in place.
- Specific haulage routes will be identified and agreed with the Local Authority prior to commencement of construction.
- Construction Traffic Management Plan has been developed and will be implemented when appropriate, ie during the delivery of materials.
- Warning Signs and Advanced Warning Signs will be installed at appropriate locations in advance of the construction works.
- All site staff parking will be accommodated on-site within the designated site compound. No parking of site vehicles will be facilitated on the public road.
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will be suitable for vulnerable users including mobility impaired persons.
- All site vehicles are to be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol, or diesel. Spill kits will be available on site. It will be the responsibility of the main contractor to ensure that all vehicles delivering to the site are suitably licensed to use the public road and equipped for this activity.

**Operational Phase**

The development location allows the user a modal choice for commuting to the site. The scheme is located in an area where local services such as retail provision and schools are within walking distance using existing pedestrian infrastructure. Additionally, a number of bus services providing high frequency access to the surrounding major employment centres are located in close proximity to the scheme location.

Per the Cork Metropolitan Area Transport Strategy (CMATS), future road infrastructural projects such as the Northern Distributor Road and the Outer Ring Road will have a fundamental effect on traffic in this area, including within the development. The completion of these road projects, in close proximity to the

development, will allow for the continued expansion of BusConnects services creating a greater supply for the transport needs of the residents. In addition, CMATS proposes the development of the Kilbarry Train Station which will provide a direct link to the city centre and to further afield. The close proximity of the train station to the site, within 20-min walk, should provide a very attractive alternative for residents when selecting their mode of travel for their daily commute.

The following mitigation measures are proposed to further reduce the traffic impact of the development.

- To encourage bicycle usage, the development includes 124 no. bicycle parking spaces, provided as internal bike storage areas in each of the 3 apartments Blocks E, F and G, covered bike storage for the 4 duplex blocks, and additional bike storage at the crèche.
- The proposed development includes pedestrian access to the existing footpaths along Old Whitechurch Rd. and on Kilbarry Enterprise Centre Rd leading to Upper Dublin Hill granting access to the wider footpath network and bus service.
- The development includes the creation of formalised walking paths to replace the informal walking paths located to the north of the site. The provision of these formal paths should encourage residents to exercise locally, removing the desire to travel via less sustainable modes of transport to other exercise destinations.

### 7.5.2 Residual impacts of the proposed development

**Construction Phase**

The traffic generated by construction works at the site lands will add traffic to the wider roads network and reduce the operational efficiency of the assessed junctions. The impact of the construction traffic will be less than the impact of the development traffic when in operation..

A summary of predicted construction phase impacts is presented in the following table.

| Mode | Cause | Quality | Mitigation | Significance | Probability | Duration of Impact |
|---|---|---|---|---|---|---|
| Traffic | Development based HGV and other traffic flow onto the existing roads network | Negative | Off-peak construction workers arrival/departure hours, off-peak delivery to from site, traffic signal-controlled access to the site | Slight | Likely | Temporary (duration of construction phase) |

**Operational Phase**

If government modal shift targets are achieved in the future, there will remain a percentage of new trips on the roads network because of the proposed scheme. These new trips will add traffic to the assessed junctions reducing their operational efficiency.

A summary of predicted operational phase impacts is presented in the following table.

| Mode | Cause | Quality | Mitigation | Significance | Probability | Duration of Impact |
|---|---|---|---|---|---|---|
| Traffic | Normal residential based traffic generated onto the existing roads network | Negative | Promotion of alternative modes of travel by means of providing adequate bicycle parking, new linkage to existing footpath network, creation of formal walkways providing local exercise options. Additional future alternative transport options in close proximity to the development per CMATS. | Moderate | Likely | Long-term |

### 7.5.3 Risk of Major Accidents and Disasters

The likelihood of an accident occurring involving development traffic is unlikely with vehicular access to the site by means of two priority-controlled junctions from Old Whitechurch Rd. and Upper Dublin Hill, each with good sightlines in both directions. The development junctions are designed in accordance with the Design Manual for Roads & Bridges and achieve the required sightlines for the posted speed limit in the area, 50kph. The provision of a footpath on the development side of Old Whitechurch Rd. coupled with the provision of pedestrian crossings will serve to urbanise the area resulting in reduced traffic speed.

## 7.6 Cumulative impacts

### 7.6.1 Construction phase

The construction stage elements of the Traffic Management Plan submitted with this application, including identified haulage routes, will be implemented.

The surrounding road network is suitable to accommodate the construction traffic associated with the proposed development. The Traffic Management Plan includes a range of mitigating measures to:

- ensure the safety of the workforce on the site
- ensure the safety of those accessing the site
- ensure the safety of the public on the surrounding roads
- minimise construction traffic generation
- minimise disruption on the surrounding road network

Adherence to the Traffic Management Plan will ensure that the impact of construction traffic of the roads network is minimal, especially during peak traffic hours.

### 7.6.2 Operational phase

Industry standard growth rates have been applied to background traffic for future year assessments (to account for further development within the area). These growth rates make allowance for modal shift targets as set by national policy but do not take account of site-specific measures that may be implemented to mitigate against traffic generation from a particular development. In this instance the development of strategic transport corridors in-line with CMATS and Bus Connects. An increase in modal shift from the recorded 19% level to 40% has been applied to development traffic in design year 2040. It was deemed inappropriate to apply this increase to prior year scenarios. The 40% figure falls short of the national target of 45% implying that the analysis presented is robust.

Measures not allowed for in the industry standard growth rates applied include future infrastructural projects in the area such as the Northern Distributor Road, the Outer Ring Road, and the Kilbarry Train Station. As previously mentioned, these projects will have a significant effect on traffic in the area and will reduce the residents' reliance on the private car.

## 7.7 Difficulties in compiling information

At the time of undertaking this assessment, the RSA Road Collision Statistics were not available in the vicinity of the development.

## 7.8 References

National Roads Authority (May 2014) Traffic and Transport Assessment Guidelines NRA, Dublin
Institution of Highways & Transportation (1994) Guidelines for Traffic Impact Assessment IHT, London
National Roads Authority (2000) Road Geometry Handbook NRA, Dublin
National Roads Authority (revised 2003) Design Manual For Roads and Bridges NRA, Dublin
National Roads Authority (November 2004) Draft Traffic and Transport Assessment Guidelines NRA, Dublin
RSA Ireland Road Collisions
http://www.rsa.ie/RSA/Road-Safety/Our-Research/Ireland-Road-Collisions/
Cork Metropolitan Area Transport Strategy (CMATS)

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## 8.0 AIR QUALITY AND CLIMATE

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**Figures, Plates and Tables**

## 8.1 Introduction

Axis environmental services were commissioned by Coakley O' Neill Town Planning/Cork County GAA Board to assess the potential air quality and climatic impacts of the proposed development on the receiving environment during the construction and operational phases of the development. This assessment includes a comprehensive description of the existing air quality in the vicinity of the subject site, a description and assessment of how construction activities and the operation of the development may impact existing air quality, the mitigation measures that will be implemented to control any potential impacts on local air quality and the local climate and the residual potential for impact, if any, of the project with mitigation measures in place.

The proposed development will consist of a strategic housing development of 319no. residential dwellings comprising of 85no. semi-detached units (comprising of 17no. 4-bed units and 68no. 3-bed units), 118no. terraced units (comprising of 8no. 4-bed units, 60no. 3-bed units and 50no. 2-bed units), 53no. duplex units (comprising of 26no. 1-bed units, 25no. 2-bed units and 2no. 3-bed units) and 63no. apartments (in 3no. part 4 storey and part 5-storey blocks and comprising 15no. 1-bed units and 48no. 2-bed units). The development also includes the provision of a crèche facility (519sqm) and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is 33,738.70sqm.

The proposed development will also consist of the demolition of a disused hurley manufacturing factory and associated out buildings, the removal and replacement of the southern and eastern boundary treatments, as well the creation of formalised walking paths to replace the informal walking paths located to the north of the site, a new through road from the proposed site access on the Old Whitechurch Road to Delaney's GAA Grounds and accessing the Upper Dublin Hill Road, with associated new boundary treatments at Delaney's GAA club, all associated ancillary site development and hard and soft landscaping works, to include the provision of private, communal and public open space, waste storage areas, bicycle, motorcycle and car parking, including EV and disabled parking, ESB substations, groundworks, foul drainage works, stormwater drainage proposals including directional drilling for the stormwater outfall, water supply proposals, public lighting, and all new boundary treatments.

This chapter of the EIAR includes a comprehensive description of the existing air quality and climate in the vicinity of the subject site, a description of how the construction and operational phases of the development may impact existing air quality and finally; the mitigation measures that shall be implemented to control and minimise the impact that the development may have on local ambient air quality and reduce the impact on the local micro climate.

### 8.1.1 Chapter Author

This chapter was compiled by Claire Boylan, AXIS environmental services. Claire has a BSc in Business and a DipSci from the University of Limerick and has a Bachelor of Science in Environmental Management from the Institute of Technology Sligo. Claire has worked at AXIS environmental services for several years and contributed to and compiled multiple Environmental Impact Assessment Reports.

### 8.1.2 Chapter Context

Directive 2014/52/EU defines '*environmental impact assessment*' as a process, which includes the responsibility of the developer to prepare an Environmental Impact Assessment Report (EIAR), and the responsibility of the competent authority to provide reasoned conclusions following the examination of the EIAR and other relevant information.

Article 1(2)(g) 4 of Directive 2014/52/EU states that "environmental 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
v. (iii) and, where appropriate, its own supplementary examination; and
vi. the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a.

The Guidelines on the Information to be contained in an *Environmental Impact Assessment Report, Environmental Protection Agency, 2017*, provide the following definition of an EIAR:

*"A statement of the effects, if any, which proposed development, if carried out, would have on the environment. The EIAR is prepared by the developer and is submitted to a CA (Competent Authority) as part of a consent process. The CA uses the information provided to assess the environmental effects of the project and, in the context of other considerations, to help determine if consent should be granted. The information in the EIAR is also used by other parties to evaluate the acceptability of the project and its effects and to inform their submissions to the CA.*

The EIAR consists of a systematic analysis and assessment of the potential effects of a proposed project on the receiving environment. The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and these factors must be addressed in the EIAR.

The EIAR should be prepared at a stage in the design process where changes can still be made to avoid adverse effects. This often results in the modification of the project to avoid or reduce effects through redesign".

In summary, EIA is a process for anticipating the effects on the environment caused by development.

### 8.1.3 Methodology

The general assessment methodology of the potential impact of the proposed development on air quality and climate has been conducted in accordance with the following guidance and legislation:

- EPA "Guidelines on the Information to be contained in Environmental Impact Assessment Reports - Draft, August 2017";
- EPA "Advice Notes for Preparing Environmental Impact Statements - Draft, September 2015";
- Environment, Community and Local Government, "Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment", August 2018;
- Desktop survey of the National and EU legislation;
- European Council (2014) (23 and 24 October 2014) Conclusions on 2030 Climate and Energy Policy Framework, SN 79/14 Framework Convention on Climate Change (FCCC) (1997) Kyoto Protocol to The United Nations Framework Convention on Climate Change;
- IPCC (2006) IPCC Guidelines for National GHG Inventories;
- IAQM Guidance on Construction Impacts, 2014;
- IAQM Guidance on the assessment of dust from demolition and construction, Version 1.1 2016;
- Greater London Authority, The Control of Dust and Emissions During Construction and Demolition, Supplementary Planning Guidance July 2014;
- IAQM Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, Version 1.1, October 2018;
- London Council, The control of dust and emissions from construction and demolition Best Practice Guidance, November 2006;
- Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC);
- The Climate Action and Low Carbon Development (Amendment) Act 2021;
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013).

The following documents and reports were reviewed as part of the desktop survey carried out as part of this chapter:

- EPA "Air Quality in Ireland 2017, Key Indicators of Air Quality, 2018";
- National Ambient Air Quality Monitoring Programme 2017 – 2022;
- Metrological Conditions obtained from Met Éireann;
- Ireland's Provisional Greenhouse Gas Emissions 1990-2020;
- Cork City Development Plan 2015 – 2021;
- Cork City Proposed Development Plan 2022 – 2028;
- Cork City Council Climate Change Adaption Strategy 2019-2024.

**Guidance and Legislation**

This assessment was prepared having regard to the requirements of the Transport Infrastructure Ireland (TII), formerly National Roads Authority (NRA) document 'Guidelines for the treatment of Air Quality during the Planning and Construction of National Road Schemes. These guidelines are relevant to the project as the proposed development will affect traffic volumes in its vicinity during the construction and operational phases. The effect of the proposed development on air quality is assessed for both the construction and operational

phases by considering the pollutant background concentrations, emissions from road traffic and the potential for construction dust. Predicted concentrations are compared to the relevant limit values. Carbon emissions are considered in terms of Ireland's climatic obligations.

To reduce the risk of poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limits are set for the protection of human health and ecosystems. Air Quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the National Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), which incorporate European Commission Directive 2008/50/EC which has set limit values for the pollutants $SO_2$, $NO_2$, $PM_{10}$, Lead, Benzene and Carbon Monoxide. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC). Provisions are also made for the inclusion of new ambient limit values relating to $PM_{2.5}$.

The European 2008/50/EC Clean Air for Europe (CAFÉ) Directive is the current air quality directive for Europe which supersedes the European Directives 1999/30/EC and 2000/69/EC.

| Pollutant | Limit Value Objective | Averaging Period | Limit Value ug/m³ | Limit Value ppb | Basis of Application of the Limit Value |
|---|---|---|---|---|---|
| $SO_2$ | Protection of human health | 1 hour | 350 | 132 | Not to be exceeded more than 24 times in a calendar year |
| $SO_2$ | Protection of human health | 24 hours | 125 | 47 | Not to be exceeded more than 3 times in a calendar year |
| $SO_2$ | Protection of vegetation | Calendar year | 20 | 7.5 | Annual mean |
| $SO_2$ | Protection of vegetation | 1 Oct to 31 Mar | 20 | 7.5 | Winter mean |
| $NO_2$ | Protection of human health | 1 hour | 200 | 105 | Not to be exceeded more than 18 times in a calendar year |
| $NO_2$ | Protection of human health | Calendar year | 40 | 21 | Annual mean |
| NO + $NO_2$ | Protection of ecosystems | Calendar year | 30 | 16 | Annual mean |
| $PM_{10}$ | Protection of human health | 24 hours | 50 | - | Not to be exceeded more than 35 times in a calendar year |
| $PM_{10}$ | Protection of human health | Calendar year | 40 | - | Annual mean |

| | | | | | |
|---|---|---|---|---|---|
| $PM_{2.5}$ - Stage 1 | Protection of human health | Calendar year | 25 | - | Annual mean |
| $PM_{2.5}$ - Stage 2 | Protection of human health | Calendar year | 20 | - | Annual mean |
| Carbon Monoxide | Protection of human health | 8 hours | 10,000 | 8620 | Not to be exceeded |
| Lead | Protection of human health | Calendar Year | 0.5 | | Annual mean |
| Benzene | Protection of human health | Calendar Year | 5 | 1.5 | Annual mean |

**Table 8.1 Air Quality Standards Regulations 2011 – Limit Values (based on EU Council Directive 2008/50/EC)**

**Dust Deposition Guidelines**

The concern from a health perspective is focused on particles of dust which are less than 10 microns ($PM_{10}$) and less than 2.5 microns ($PM_{2.5}$) and the EU ambient air quality standards outlined in the table above, have set ambient air quality limit values for $PM_{10}$ and $PM_{2.5}$.

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 type of 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 350mg/(m2*day) averaged over a one-year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Health and Local Government (DEHLG, 2004) apply the Bergerhoff limit of 350mg/(m2*day) to the site boundary of quarries. The limit value can also be implemented with regard to dust impacts from construction projects.

**Climate Agreements**

Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in 1997 (Framework Convention on Climate Change, 1999 and Framework Convention on Climate Change, 1997). For the purposes of the EU burden sharing agreement under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six GHGs under the Kyoto Protocol to 13% above the 1990 level over the period 2008 to 2012. The UNFCCC is continuing detailed negotiations in relation to GHGs reductions and in relation to technical issues such as Emission Trading and burden sharing. The most recent Conference of the Parties (COP22) to the agreement was convened in Marrakesh, Morocco in December 2016. Prior to this COP21 was held in Paris, France in December 2015. COP21 was an important milestone in terms of international climate change agreements. The "Paris Agreement", agreed by over 200 nations, has a stated aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatons as soon as possible whilst acknowledging

that peaking of GHG emissions will take longer for developing countries. Contributions to greenhouse gas emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made on elevating adaption onto the same level as action to cut and curb emissions.

The EU, on the 23/24th of October 2014, agreed the "2030 Climate and Energy Policy Framework" (EC, 2014). The European Council endorsed a binding EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The target will be delivered collectively by the EU in the most cost-effective manner possible, with the reductions in the ETS and non-ETS sectors amounting to 43% and 30% by 2030 compared to 2005, respectively. Secondly, it was agreed that all Member States will participate in this effort, balancing considerations of fairness and solidarity. The policy also outlines, under "Renewables and Energy Efficiency", an EU binding target of at least 27% for the share of renewable energy consumed in the EU in 2030.

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. The initial objective of the Protocol was to control and reduce emissions of Sulphur Dioxide ($SO_2$), Nitrogen Oxides ($NO_X$), Volatile Organic Compounds (VOCs) and Ammonia ($NH_3$). To achieve the initial targets Ireland was obliged, by 2010, to meet national emission ceilings of 42kt for $SO_2$ (67% below 2001 levels), 65kt for $NO_X$ (52% reduction), 55kt for VOCs (37% reduction) and 116kt for $NH_3$ (6% reduction). In 2012, the Gothenburg Protocol was revised to include national emission reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emission reduction commitments for $PM_{2.5}$. In relation to Ireland, 2020 emission targets are 25kt for $SO_2$ (65% on 2005 levels), 65kt for $NO_X$ (49% reduction on 2005 levels), 43kt for VOCs (25% reduction on 2005 levels), 108kt for $NH_3$ (1% reduction on 2005 levels) and 10kt for $PM_{2.5}$ (18% reduction on 2005 levels).

European Commission Directive 2001/81/EC, the National Emissions Ceiling Directive (NECD), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005. Data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for $SO_2$, VOCs and $NH_3$ but failed to comply with the ceiling for $NO_X$. Directive (EU) 2016/2284 "On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC" was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for $SO_2$, $NO_X$, NMVOC, $NH_3$ and $PM_{2.5}$. In relation to Ireland, 2020-29 emission targets are for $SO_2$ (65% below 2005 levels), for $NO_X$ (49% reduction), for VOCs (25% reduction), for $NH_3$ (1% reduction) and for $PM_{2.5}$ (18% reduction). In relation to 2030, Ireland's emission targets are for $SO_2$ (85% below 2005 levels), for $NO_X$ (69% reduction), for VOCs (32% reduction), for $NH_3$ (5% reduction) and for $PM_{2.5}$ (41% reduction).

In 2019, the EU endorsed a new target of achieving net zero greenhouse gas emissions by 2050. The Commission committed to presenting an impact assessed plan to increase the existing target for 2030 of reducing emissions by 40% to at least 50% (as against 1990 levels). In Ireland, the current coalition government has enacted an ambitious Climate Law 'The Climate Action and Low Carbon Development (Amendment) Act 2021' which has committed the State to 2030 and 2050 targets for reducing greenhouse gas emissions and providing the

governance framework by which this is to be realised. As compared to the 2015 Act this is a significantly strengthened obligation, more clearly imposed on the State.

The new law will require the government to adopt a series of five-year carbon budgets across all sectors over the next 15 years. Sectors such as transport and agriculture will require significant reform to meet future targets. The first two carbon budgets must provide for a reduction in GHG emissions of 51% by the end of 2030 as against 2018 levels.

The assessment of impact will be based on the EPA Guidance:

| | |
|---|---|
| **Quality of Effects**<br>**It is important to inform the non-specialist reader whether an effect is positive, negative or neutral** | **Positive Effects**<br>A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities). |
| | **Neutral Effects**<br>No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error. |
| | **Negative/adverse Effects**<br>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). |
| **Describing the Significant Effects** | **Imperceptible**<br>An effect capable of measurement but without significant consequences |
| | **Not significant**<br>An effect which causes noticeable2 changes in the character of the environment but without significant consequences. |
| | **Slight Effects**<br>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities. |
| | **Moderate Effects**<br>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. |
| | **Significant Effects**<br>An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment. |
| | **Very Significant**<br>An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment. |
| | **Profound Effects**<br>An effect which obliterates sensitive characteristics |

**Site Investigation**

The subject site comprises a stated area of 14.84 ha, located at Kilbarry off the Old Whitechurch on the northern edge of Cork City, approx. 1.2km north of Blackpool centre. The main part of these irregularly shaped lands (8.68ha) is relatively elevated and is under grass, having been previously in use as a playing pitch. The northwestern part of the lands falls (c. 5.18ha), relatively steeply toward the Bride River / Glenamought River Valley. Parts of the slopes include areas of scrub and the lower slopes adjoining the river are more heavily overgrown. The southern portion of the lands is located to the north of City North Business Park and to the rear / east of existing residential properties fronting the Old Whitechurch Road. To the east of the site are the grounds of Delaneys GAA club and there is a large pylon in the northeastern corner of the site, north of the GAA club lands.

An existing access lane from the Old Whitechurch Road runs along the southern edge of the site, which previously provided access to the GAA club. The club is now accessed from the Upper Dublin Hill via the Kilbarry Enterprise Centre / estate, to the southeast. An embankment toward the eastern part of the site marks a change / step-up in levels as one moves east. There is a small scale, derelict factory building on the western part of the lands, adjoining the entrance from the Old Whitechurch Road which is bounded by a number of mature trees.
An assessment of the baseline conditions included a desktop survey and a site visit. A site visit was conducted on the 1st June 2022 by Claire Boylan, AXIS environmental. The visit included a site inspection, measurement of ambient particulate levels, installation of passive samplers and Bergerhoff dust jars.

Impact of the proposed site development and operations are considered by taking account of the existing baseline conditions, projected impacts and compliance with relevant standards outlined in the appropriate legislation. The site is primarily a greenfield site with the demolition works consisting of a disused factory and associated outbuildings. (Figure 8.1)


**Figure 8.1: Proposed Development Site Kilbarry**

The principal potential impacts would be from particulate matter released from earthworks, trackout, construction and to a lesser extent demolition activities. There is some limited potential for emissions from construction equipment including nitrogen oxides, carbon monoxide and particulate matter. Impacts including climate change impacts were assessed based on the pollutants that could be generated. When considering a development of this nature, the impacts are required to be assessed in the surroundings for both the period of the construction phase and long-term operation of the proposed development.

A review of the surrounding area was undertaken with specific focus on land use and sensitive receptors. A sensitive receptor can be defined as any living thing which can be adversely affected by contaminants and/or pollution. This may include hospitals, child care facilities, elderly housing, convalescent facilities and more. In this context, a review of the most likely sensitive receptors was determined within a catchment of 1km. With respect to the surrounding area, the nearest receptors were identified as industrial/commercial premises, residential dwellings/apartments and public walkways.

The following table indicates how sensitive receptors would be defined for the purposes of this report:

| Classification | Human | Ecological |
|---|---|---|
| **High Sensitivity Receptor** | Locations where members of the public are exposed over a time period relevant to the air quality objective for $PM_{10}$ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).<br>• Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment. | Locations with an international or national designation *and* the designated features may be affected by dust soiling; or<br>• Locations where there is a community of a particularly dust sensitive species.<br>Indicative examples include a Special Area of Conservation (SAC) that is dust sensitive. |
| **Medium Sensitivity Receptor** | Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for $PM_{10}$ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).<br>• Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to $PM_{10}$, as protection is covered by Health and Safety at Work legislation. | Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or<br>• Locations with a national designation where the features may be affected by dust deposition.<br>• Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features |
| **Low Sensitivity Receptor** | Locations where human exposure is transient.<br>• Indicative examples include public footpaths, playing fields, parks and shopping street. | Locations with a local designation where the features may be affected by dust deposition.<br>• Indicative example is a local Nature Reserve with dust sensitive features. |

**Table 8.2 Sensitivity Classification**

**Assessment methodology**

Air quality assessments are concerned with the presence of airborne pollutants in the atmosphere. The likely significant effects of the proposed developments on air quality have been assessed by considering the background concentration levels of pollutants in the atmosphere and the potential for construction and operation effects associated with the proposed development.

This assessment has been undertaken with regard to the Transport Infrastructure Ireland (TII), air quality guidelines[1]. These guidelines provide a methodology for the assessment, management, and mitigation of air quality at construction sites which can be adapted to suit the nature of the works.

The TII Guidelines state that increases in Annual Average Daily Traffic (AADT) flows of less than 5% and 10% during the operational and construction phases of a development, respectively, are unlikely to result in significant air quality effects.

Likely significant effects on air quality are therefore assessed when the AADT flows are projected to increase above these thresholds during construction and operation of the proposed development.

Traffic volumes assessed, show that the anticipated increases are in excess of 10% for all associated link roads and junctions therefore the potential impact of the increase will be assessed further in this chapter.

The assessment methodology involved air dispersion modelling using the UK DMRB Screening Model (11.0) Released November 2021. The inputs to the air dispersion model consist of information on road layouts, receptor locations, annual average daily traffic movements (AADT), annual average traffic speeds and background concentrations. Using the input data the model predicts ambient ground level concentrations at the worst-case concentrations at the worst-case sensitive receptor using generic meteorological data. This worst-case concentration was then added to the existing background concentration to give the worst-case predicted ambient concentration and compared with the relevant ambient air quality standard.

The impact pf the development is assessed in terms of relative additional contribution of the development to pollutant levels. Guidance on determining air quality impact of road schemes published by the NRA was used for this assessment. In terms of significance criteria, all sensitive locations for human exposure and for ecosystems are judged to be of 'high sensitivity'. The significance criteria have been detailed in Tables 8-3 to 8-5 below. The significance criteria are based on $PM_{10}$, $PM_{2.5}$ and $NO_2$ only as these pollutants are most likely to exceed the limit values.

The potential impact of the proposed development on microclimate was considered in relation to the existing local weather conditions and the size and nature of the development.

The regional impact of the proposed development at a national / international level during operation was assessed using the approach detailed by the NRA (TII) [1]. This provides a method for the prediction of the impact of emissions of pollutants from road schemes on a regional scale using the regional impact assessment mode of the UK DMRB Screening Model [8]. The assessment focused on determining the increase in annual emissions of carbon dioxide during operation of the proposed development. Inputs to the DMRB model consist of information such as road lengths, annual average daily traffic movements (AADT), road link type and annual

[1] Transport Infrastructure Ireland (TII), formerly the National Roads Authority (NRA) (2011). Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes. TII, Ireland.

average traffic speeds. Using this input data, the model predicts the total carbon emissions resulting from operation of the facility in a specified year.

With regard to average traffic speeds, road traffic on link roads close to the development were modelled at speeds 50 kph.

| Magnitude of Change | Annual Mean NO2 / PM10 | No. days with PM10 concentration greater than 50 µg/m$^3$ | Annual Mean PM2.5 |
|---|---|---|---|
| Large | Increase/decrease ≥4 µg/m$^3$ | Increase/decrease >4 days | Increase/decrease ≥2.5 µg/m$^3$ |
| Medium | Increase/decrease 2 - <4 µg/m$^3$ | Increase/decrease 3 or 4 days | Increase/decrease 1.25 - <2.5 µg/m$^3$ |
| Small | Increase/decrease 0.4 - <2 µg/m$^3$ | Increase/decrease 1 or 2 days | Increase/decrease 0.25 - <1.25 µg/m$^3$ |
| Imperceptible | Increase/decrease <0.4 µg/m$^3$ | Increase/decrease <1 day | Increase/decrease <0.25 µg/m$^3$ |

**Table 8.3 Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations**

| Absolute Concentration in Relation to Objective/Limit Value | Change in Concentration[a] | | |
|---|---|---|---|
| | Small | Medium | Large |
| Increase with Scheme | | | |
| Above Objective/Limit Value With Scheme (≥40 µg/m$^3$ of $NO_2$ or $PM_{10}$) (≥25 µg/m$^3$ of $PM_{2.5}$) | Slight Adverse | Moderate Adverse | Substantial Adverse |
| Just Below Objective/Limit Value With Scheme (36-<40 µg/m$^3$ of $NO_2$ or $PM_{10}$) (22.5-<25 µg/m$^3$ of $PM_{2.5}$) | Slight Adverse | Moderate Adverse | Moderate Adverse |
| Below Objective/Limit Value With Scheme (30-<36 µg/m$^3$ of $NO_2$ or $PM_{10}$) (18.75-<22.5 µg/m$^3$ of $PM_{2.5}$) | Negligible | Slight Adverse | Slight Adverse |
| Well Below Objective/Limit Value With Scheme (<30 µg/m$^3$ of $NO_2$ or $PM_{10}$) (<18.75 µg/m$^3$ of $PM_{2.5}$) | Negligible | Negligible | Slight Adverse |
| Decrease with Scheme | | | |
| Above Objective/Limit Value With Scheme (≥40 µg/m$^3$ of $NO_2$ or $PM_{10}$) (≥25 µg/m$^3$ of $PM_{2.5}$) | Slight Beneficial | Moderate Beneficial | Substantial Beneficial |
| Just Below Objective/Limit Value With Scheme (36-<40 µg/m$^3$ of $NO_2$ or $PM_{10}$) (22.5-<25 µg/m$^3$ of $PM_{2.5}$) | Slight Beneficial | Moderate Beneficial | Moderate Beneficial |
| Below Objective/Limit Value With Scheme (30-<36 µg/m$^3$ of $NO_2$ or $PM_{10}$) (18.75-<22.5 µg/m$^3$ of $PM_{2.5}$) | Negligible | Slight Beneficial | Slight Beneficial |
| Well Below Objective/Limit Value With Scheme (<30 µg/m$^3$ of $NO_2$ or $PM_{10}$) (<18.75 µg/m$^3$ of $PM_{2.5}$) | Negligible | Negligible | Slight Beneficial |

**Table 8.4 Air Quality Impact Descriptors for Changes to Annual Mean NO2 / PM10 and PM2.5 Concentrations at a Receptor**
**a Where the Impact Magnitude is Imperceptible, then the Impact Description is Negligible.**

| Absolute Concentration in Relation to Objective/Limit Value | Change in Concentration[a] | | |
|---|---|---|---|
| | Small | Medium | Large |
| Increase with Scheme | | | |
| Above Objective/Limit Value With Scheme (≥35 days) | Slight Adverse | Moderate Adverse | Substantial Adverse |
| Just Below Objective/Limit Value With Scheme (32-<35 days) | Slight Adverse | Moderate Adverse | Moderate Adverse |
| Below Objective/Limit Value With Scheme (26-<32 days) | Negligible | Slight Adverse | Slight Adverse |
| Well Below Objective/Limit Value With Scheme (<26 days) | Negligible | Negligible | Slight Adverse |
| Decrease with Scheme | | | |
| Above Objective/Limit Value With Scheme (≥35 days) | Slight Beneficial | Moderate Beneficial | Substantial Beneficial |
| Just Below Objective/Limit Value With Scheme (32-<35 days) | Slight Beneficial | Moderate Beneficial | Moderate Beneficial |
| Below Objective/Limit Value With Scheme (26-<32 days) | Negligible | Slight Beneficial | Slight Beneficial |
| Well Below Objective/Limit Value With Scheme (<26 days) | Negligible | Negligible | Slight Beneficial |

**Table 8.5 Quality Impact Descriptors for Changes to Number of Days with PM10 Concentration Greater than 50 µg/m$^3$ at a Receptor**

**Source of information**

The existing ambient air quality in the vicinity of the site has been characterised with information obtained from a number of sources as follows:

- Environmental Protection Agency's Monitoring Data
- Site specific air quality monitoring survey at site boundary

The ambient air quality data collected and reviewed for the purpose of this study focused on the principal substances (dust, vehicle exhaust emissions and boiler emissions) which may be released from the site during the construction and operation phases and which may impact local air quality.

Under the Clean Air for Europe Directive, EU Member states must designate ''Zones'' for the purpose of managing air quality. For Ireland, four zones were defined in the Air Quality Standards Regulations (In order to assess a range of pollutants in the development area it is necessary to review current air quality ). The zones were amended on 1st January 2013 to take account of population counts from the 2011 CSO Census and to align with the coal restricted areas in the 2012 Regulations (S.I. No. 326 of 2012). Cork is defined within the regulations as Zone B.

EPA ambient air monitoring stations are situated at 8 locations in Cork with the three closest to the proposed development location being University College Cork, Cork Lower Glanmire Road and Mallow Table 8.6

| Pollutant | April | May | June |
|---|---|---|---|
| NO2 | 20.04 µg/m$^3$ | 13.90µg/m$^3$ | 13.60µg/m$^3$ |
| PM10 | 16.87 µg/m$^3$ | 11.53 µg/m$^3$ | 11.47µg/m$^3$ |
| PM2.5 | 8.07 µg/m$^3$ | 4.40 µg/m$^3$ | 3.45µg/m$^3$ |

**Table 8.6: Background Concentrations EPA Ambient Monitoring**

A site visit was carried out on the 1st June 2022. An Osiris air monitoring device which measures airborne particulate was used at two locations over a one-hour period to assess current $PM_{10}$ and $PM_{2.5}$ levels. The locations monitored were at the eastern boundary of the site adjacent to Delaneys GAA Club Car Park (Location 1) and at the western boundary of the site adjacent to domestic residences (Location 2). The readings are detailed in Table 8.7.

| Pollutant | Location 1 | Location 2 |
|---|---|---|
| PM10 | 7.3 µg/m$^3$ | 6.4 µg/m$^3$ |
| PM2.5 | 3.78 µg/m$^3$ | 2.36 µg/m$^3$ |

**Table 8.7 Site Visit Monitoring Results June 1st**

**Local Meteorological Conditions**

The nearest synoptic weather station operated by Met Éireann with long-term data available (for over 30 years) is located at Cork Airport, approximately 8 km south west of the site. The World Meteorological Organization (WMO) recommends that climate averages are computed over a 30-year period of consecutive records. This period is considered to be sufficiently long enough to smooth out year to year variations in meteorological parameters. The meteorological data listed below was obtained from Met Éireann and is based on 30-year records for Cork airport over the period 1981-2010.

The annual mean temperature is 9.9°C, with a mean daily maximum of 12.9°C and a mean daily minimum of 6.9°C. The mean relative humidity at 09:00 is 87% and at 15:00 is 77%. The mean daily sunshine duration ranges from 2.0 hours in winter to 5.5 hours in summer, with an annual average of 3.9 hours. The annual mean rainfall is 1228 mm with average monthly totals ranging from 76.5 mm (April) to 138 mm (October). On average, 152 days are recorded per year with rainfall greater than 1.0 mm. The annual mean wind speed is 10.5 m/s.

**Policy & Legislative Measures**

Ireland has annual GHG targets which are set at an EU level and need to be complied with in order to reduce the impact of climate change. Impacts to climate as a result of GHG emissions are assessed against the targets set out by the EU under Regulation (EU) 2018/842 on binding annual greenhouse gas 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 which has set a target of a 30% reduction in non-ETS sector emissions by 2030 relative to 2005 levels.

An EPA Report, completed in 2021, 'Ireland Provisional Greenhouse Gas Emissions 1990 – 2020, reports that in 2020, emissions from Ireland transport sector decreased by 15.7% or 1.92 Mt CO2 equivalent in 2020. The impact was largely COVID driven with restrictions on passenger car and public transport use. Other factors contributing to the decrease include improved vehicle efficiency, increased use of biofuels and a significant decrease in fuel tourism. At the end of 2020, there was approximately 14% of the 2025 policy target for battery and hybrid vehicles. The impact of EV's is expected to contribute more to reduced vehicle emissions by the end of the decade.

Addressing the proposed project's impact on Climate will be done in accordance with the EU guidance document, Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013). Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide ($CO_2$) which will impact climate.

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessment LA 114 Climate (UK Highways Agency, 2019b). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. During the operational phase, if any of the road links impacted by the proposed development meet the below criteria then further as assessment is required:

A change of more than 10% in AADT;

A change of more than 10% to the number of heavy-duty vehicles; and

A change in daily average speed of more than 20 km/hr.

Road links and Junctions which will experience an increase of 10% or more in the AADT are detailed below. The impact of the proposed development at a national/international level has been determined using the procedures given by Transport Infrastructure Ireland (2011) and the methodology provided in Annex D in the UK Design Manual for Roads and Bridges (UK Highways Agency, 2007). The assessment focused on determining the resulting change in emissions of carbon dioxide (CO2). The Annex provides a method for the prediction of the regional impact of emissions of these pollutants from road schemes and can be applied to any project that

causes a change in traffic. Background concentrations were based on available EPA background monitoring data.

| Link Name/Junctions | 2022 Existing | 2025 No Development (ND) | 2025 With Development (WD) | % Change |
|---|---|---|---|---|
| Old Whitechurch Rd/ Dev Dist Rd. | 617.88 | 651.58 | 3359.01 | 443.64% |
| Old Whitechurch Rd/ Old Mallow Rd. | 6145.08 | 6482.10 | 7976.24 | 29.80% |
| Redforge Rd./ Dublin St. | 16356.92 | 17244.41 | 18424.00 | 12.64% |
| Kilbarry Enterprise Centre/ Upper Dublin Hill | 10652.85 | 11231.55 | 11786.64 | 10.64% |
| Upper Dublin Hill/Lower Dublin Hill | 14125.07 | 14904.54 | 15459.63 | 9.45% |
| Old Whitechurch Rd. | 617.88 | 651.58 | 2145.72 | 247.27% |
| Redforge Rd. | 6010.27 | 6324.82 | 7504.41 | 24.86% |
| Redforge Rd. | 9762.47 | 10279.24 | 11458.83 | 17.38% |
| Dublin St. | 10211.84 | 10751.08 | 11267.85 | 10.34% |
| Dublin St. | 12739.52 | 13413.57 | 14076.39 | 10.49% |
| Lower Dublin Hill | 6294.87 | 6625.55 | 6790.90 | 7.88% |
| Upper Dublin Hill | 10546.56 | 11101.64 | 11656.72 | 10.53% |
| Dev Dist Rd. | 0 | 0.00 | 2707.43 | 270642% |

**Table 8.8 AADT traffic figures**

## 8.2 Potential Impacts

The main air quality impacts that may arise during the proposed construction / demolition activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated $PM_{10}$ and $PM_{2,5}$ concentrations, as a result of dust generating activities on site;

To a lesser extent, increase in concentrations of airborne particles and nitrogen dioxide due to exhaust emissions from diesel powered vehicles and equipment used on site.

The most common impacts are dust soiling and increased ambient $PM_{10}$ concentrations due to dust arising from activities on the site. Dust soiling will arise from the deposition of Particulate Matter (PM) in all size fractions, but would be associated mostly with particulate matter greater than 10 µm. The ambient PM relevant

to health outcomes would be that measured as $PM_{10}$, although most of this will be in the $PM_{2.5-10}$ fraction, rather than the $PM_{2.5}$ portion.

In general, 85% to 90% by weight of the fugitive dust emissions of $PM_{10}$ from construction sites are $PM_{2.5-10}$ and 10% to 15% are in the $PM_{2.5}$ fraction.

There are other potential impacts, such as the release of heavy metals, asbestos fibres or other pollutants during the demolition of certain older type buildings or the removal of contaminated soils. An asbestos survey should be completed in line with legislative requirements prior to any demolition, confirming the presence or absence of asbestos within the structure.

Experience of assessing the exhaust emissions from on-site plant and site traffic suggest that they are unlikely to make a significant impact on local air quality, and they will not need to be quantitatively assessed. The gases from Heavy Duty Vehicles (HDV) include Oxides of Nitrogen (NOx), Nitrogen Dioxide ($NO_2$), Carbon Monoxide, Sulphur Dioxide and unburnt hydrocarbons. The number and intensity of HDV at this proposed development will not be significant in terms of local traffic emissions in Cork City and environs.

The construction stage traffic has been reviewed and a screening determined that none of the link roads will be impacted by the proposed development based on assessment criteria:

- Annual average daily traffic (AADT) changes by 1,000 or more during construction;
- Heavy duty vehicle (HDV) changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The construction stage traffic has the potential for a negligible and short-term impact on air quality.

A human 'receptor', refers to any location where a person may experience the annoyance effects of airborne dust or dust soiling, or exposure to $PM_{10}$ over a time period relevant to the air quality objectives. In terms of annoyance effects, this will most commonly relate to residential dwellings, but may also refer to industrial and commercial premises that have a particular sensitivity to dust impacts. The impact of dust from construction and demolition is generally localised (within 50 – 200 meters from the works).

The surrounding area has also been assessed for the presence of any ecological receptor or sensitive habitat which would be affected by dust soiling. This includes the direct impacts on vegetation or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats). The location of the nearest Special Areas of Conservation or Special Protected Areas was assessed for proximity and potential impact by this development.

The risk of dust emissions from any demolition / construction site causing loss of amenity and/or health or ecological effects is generally related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activity;
- The size of the site;

- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activity;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The quantity of dust emitted from construction operations is related to the area of land being worked and the level of construction activity (nature, magnitude and duration). Emissions from construction vehicles passing over unpaved ground can be particularly important. The impact is determined by the silt content of the soil, as well as the speed and weight of the vehicle, the soil moisture content, the distance covered and the frequency of vehicle movements.

Wind direction, wind speed and rainfall, at the time when a demolition / construction activity is taking place, will also influence whether there is likely to be a dust impact. Due to the variability of the weather, it is impossible to predict what the weather conditions will be when specific construction activities are being undertaken. Therefore, the assessment of construction dust impacts are typically qualitative in this report. Adverse impacts can occur in any direction from the site; however, they are more likely to occur downwind of the prevailing wind. Winds in Cork City are generally in a south south westerly direction, which would mean that receptors from this site would in general be to the NNE of the development.

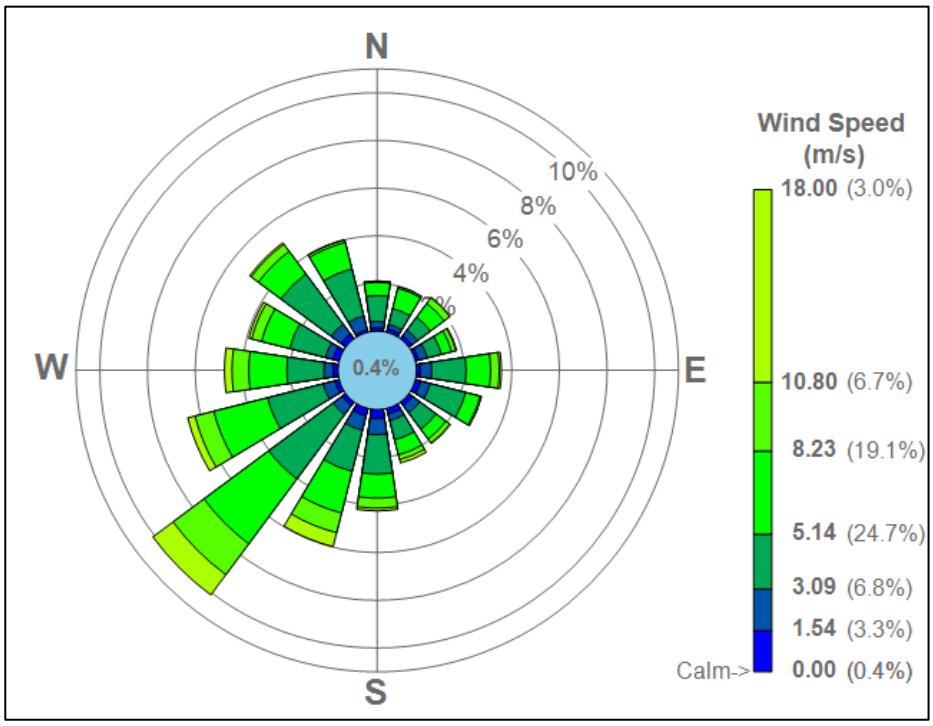



**Figure 8.2 Wind Rose for Cork City**

Dust impacts are more likely to occur during drier periods as rainfall acts as a natural dust suppressant. Local wind speed and direction data can be used to assess the risk of a significant dust impact. This will depend on the frequency that the receptor is downwind and the distance of the receptors from the construction activities. It is generally the higher wind speeds that will result in the highest potential for release of dust from a site. Given that this development is in Cork City Northern Environs it is important to take account of the effect of buildings on local wind patterns. Impacts during the summer and winter months are generally very different given the higher rainfall levels in winter and number of occasions with higher wind speeds.

There are five primary factors which influence the potential for dust to be generated from the site.
These are:

- Wind speed across the surface. Dust emissions from exposed surfaces generally increase with increasing wind speed. However, dust pick up by winds is only significant at wind speeds above 5m/s. Above wind speeds of 10m/s dust pick up increases rapidly.
- Moisture content of the material. Moisture binds particles together, preventing them from being disturbed by winds or vehicle movements. Similarly, vegetated surfaces are less prone to wind erosion than bare surfaces.
- The area of exposed surface. The larger the area of exposed surfaces the more potential there will be for dust emission.
- The percentage of fine particles in the material on the surface. The smaller the particle size of material on an exposed surface the more easily the particles are able to be picked up and entrained in the wind.
- Disturbances such as traffic and loading and unloading of materials. Vehicles travelling over exposed surfaces tend to pulverise any surface particles. Particles are displaced from rolling wheels and the surface. Dust is also sucked into the turbulent wake created behind moving vehicles.

### 8.2.1 Demolition/Construction Phase

**Ambient Air Quality**

The greatest potential impact on air quality during the construction phase of the proposed development is from demolition and construction dust emissions which have the potential for nuisance dust outside the boundary of the proposed site.

| Activity | Discharge | Potential Impact |
|---|---|---|
| Demolition | Dust / $PM_{10}$ | There are existing buildings would be knocked as part of the project. Crushing, screening, and demolition activities give rise to dust. |
| Earthworks | Dust / $PM_{10}$ | There are existing buildings would be knocked as part of the project. Crushing, screening, and demolition activities give rise to dust. |
| Construction | Dust / $PM_{10}$ | Excavation, haulage, tipping, stockpiling will all contribute to dust in the area. |
| Trackout | Dust / $PM_{10}$ | Raw materials, (stone, sand, cement), concreting, sandblasting, con sawing, piling can all generate dust. |

**Table 8.9 Demolition/Construction activities with the potential to generate discharges into the air**

There are four main categories in which the proposed development at Kilbarry will potentially impact on the local environment. The impacts as outlined in Table 8-8 will primarily be in the form of dust fall in the smaller fractions of dust and $PM_{10}$ / $PM_{2.5}$. Combustion gases or ozone would not be considered significant or have the potential to impact the ambient air quality in terms of limits from the CAFÉ Directive given the proposed activities and would not be considered for inclusion in the appropriate risk assessment.

| Distance to Nearest Receptor (m) | | Dust Emission Class | | |
|---|---|---|---|---|
| Dust Soiling and $PM_{10}$ | Ecological | Large | Medium | Small |
| <20 | - | High Risk Site | High Risk Site | Medium Risk Site |
| 20 – 100 | <20 | High Risk Site | Medium Risk Site | Low Risk Site |
| 100 – 200 | 20 - 40 | Medium Risk Site | Low Risk Site | Low Risk Site |
| 200 - 350 | 40 - 100 | Medium Risk Site | Low Risk Site | Negligible |
| Assessment Criteria<br>Large: Total building volume >50,000$m^3$ , potentially dusty construction material (e.g. concrete),on site crushing and screening, demolition activities >20m above ground level;<br>Medium: Total building volume 20,000$m^3$ – 50,000$m^3$ , potentially dusty construction material, demolition activities 10-20m above ground level; and<br>Small: Total building volume <20,000 $m^3$, construction material with low potential for dust release, demolition activities <10m above ground, demolition during wetter months | | | | |
| There is only one area where demolition is to be carried out, on the western boundary of the site. It is between 20 – 100m from the nearest sensitive receptor. The demolition area would be classed as small <20,000m3. There are no ecological sensitive receptors <100m from the development. | | | | |
| Classification: Low Risk Site | | | | |

**Table 8.10 Risk Category from Demolition Activities**

| Distance to Nearest Receptor (m) | | Dust Emission Class | | |
|---|---|---|---|---|
| Dust Soiling and $PM_{10}$ | Ecological | Large | Medium | Small |
| <20 | - | High Risk Site | High Risk Site | Medium Risk Site |
| 20 - 50 | - | High Risk Site | Medium Risk Site | Low Risk Site |
| 20 – 100 | <20 | High Risk Site | Medium Risk Site | Low Risk Site |
| 100 – 200 | 20 - 40 | Medium Risk Site | Low Risk Site | Low Risk Site |
| 200 - 350 | 40 - 100 | Medium Risk Site | Low Risk Site | Negligible |
| Assessment Criteria<br>Large: Total site area >10,000$m^2$, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100,000 tonne;<br>Medium: Total site area 2,500$m^2$ – 10,000$m^2$, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m – 8m in height, total material moved 20,000 tonne – 100,000 tonne; and<br>Small: Total site area <2,500m2, soil type with large grain size (e.g. sane), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <10,000 tonne, earthworks during wetter months. | | | | |
| The site area would be classed as medium. The nearest sensitive receptor will be within 20m – 50m of some of the earthworks on the western boundary. There are no ecological sensitive receptors <100m from the development. | | | | |
| Classification: Medium Risk Site | | | | |

**Table 8.11 Risk Category from Earthwork Activities**

| Distance to Nearest Receptor (m) | | Dust Emission Class | | |
|---|---|---|---|---|
| Dust Soiling and $PM_{10}$ | Ecological | Large | Medium | Small |
| <20 | - | High Risk Site | High Risk Site | Medium Risk Site |
| 20 - 50 | - | High Risk Site | Medium Risk Site | Low Risk Site |
| 20 – 100 | <20 | Medium Risk Site | Medium Risk Site | Low Risk Site |
| 100 – 200 | 20 - 40 | Medium Risk Site | Low Risk Site | Negligible |
| 200 - 350 | 40 - 100 | Low Risk Site | Low Risk Site | Negligible |
| Assessment Criteria<br>Large: Total building volume >100,000$m^3$ , piling, on site concrete batching; sandblasting,<br>Medium: Total building volume 25,000$m^3$ – 100,000$m^3$, potentially dusty construction material (e.g. concrete), piling, on site concrete batching; and<br>Small: Total building volume <25,000 $m^3$, construction material with low potential for dust release. | | | | |
| Given the building volumes are circa 100,000 $m^3$ but the materials that would be used in the build are not particularly dusty and would have low potential for dust release, the site would be considered a low to medium risk of dust nuisance at receptors between 20 – 350m. | | | | |
| Classification: Medium Risk Site | | | | |

**Table 8.12 Risk Category from Construction Activities**

| Distance to Nearest Receptor (m) | | Dust Emission Class | | |
|---|---|---|---|---|
| Dust Soiling and $PM_{10}$ | Ecological | Large | Medium | Small |
| <20 | - | High Risk Site | High Risk Site | Medium Risk Site |
| 20 - 50 | <20 | Medium Risk Site | Medium Risk Site | Low Risk Site |
| 50 – 100 | 20-100 | Low Risk Site | Low Risk Site | Negligible |
| Assessment Criteria<br>Large: >100 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;<br>Medium: 25-100 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and<br>Small / Medium: <25 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50m | | | | |
| Given that there could be c. 10 - 20 trips during peak activity at this site the site would be considered as a medium dust emission class site, with high risk to receptors <20m from the development. Haul roads and roadways will be transporting the material away from the identified locally important habitat (<20m – 100m) | | | | |
| Classification: High Risk Site | | | | |

**Table 8.13 Risk Category from Track Out Activities**

| Source | Dust Soiling effect | Ecological Effects | Health effects |
|---|---|---|---|
| Demolition | Low Risk Site | Low Risk Site | Low |
| Earthworks | Medium Risk Site | High Risk Site | Low |
| Construction | Medium Risk Site | Medium Risk Site | Low |
| Trackout | High Risk Site | Low Risk Site | Medium |

**Table 8.14 Summary of the Risk of Dust Effects with no Mitigation**

The determination of risk effects is combined with the sensitivity of the surrounding landscape in terms of human health, air quality and ecological receptors. Dependent on the level of risk and level of impact, suitable controls and mitigation measures are implemented. These measures will form part of the Construction Environmental Management Plan to ensure there is no negative impact during construction.

The overall impact on ambient air quality from the construction phase of the development will be negative, moderate, likely and short-term in the absence of any mitigation measures.

**Human Health & Ecological Impacts**

While construction dust tends to be deposited primarily within the confines of the construction site, the majority of the deposition occurs within the first 50 meters from source. The western and south western boundaries of the site are within 20 - 50 metres of private residences and commercial establishments. Particulate matter from demolition and earthwork activities will be most likely to impact these receptors during these phases. These receptors are identified in Figure 8.3 below.


**Figure 8.3 Sensitive Receptors within 50m radius**

The range of effects to human health and the local environment differs, with each compound having its own specific risk.

**Particulate matter ($PM_{10}$)**

The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometres in diameter pose the greatest problems, because they can penetrate into the lungs, and some may even enter the bloodstream. Exposure to such particles can affect the lungs and heart. Particle pollution exposure has been linked to a variety of problems, including:

- Premature death in people with heart or lung disease;
- Nonfatal heart attacks;
- Irregular heartbeat;
- Decreased lung function;

- Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.

Particles can be carried over long distances by wind and then settle on ground or water. Depending on their chemical composition, the effects of this settling may include:

- Making lakes and streams acidic;
- Changing the nutrient balance in coastal waters and large river basins;
- Depleting the nutrients in soil;
- Damaging sensitive forests and farm crops;
- Affecting the diversity of ecosystems;
- Contributing to acid rain effects.
-

In order to minimise the impact of particulate matter on the local environment, limits have been set out in the EU Directive 2008/50/EC, also known as the CAFÉ Directive. The limits for particulate matter in the form of $PM_{10}$ are to ensure 24-hour average concentrations do not exceed 50ug/$m^3$ on more than 35 occasions in any one year, or an annual average of 40ug/$m^3$. From 2020, a limit of 20ug/$m^3$ for an annual average for particulate matter less than 2.5 microns is applied for an annual mean.

**Oxides of Nitrogen (NOx)**

NOx mainly impacts on respiratory conditions causing inflammation of the airways at high levels. Long term exposure can decrease lung function, increase the risk of respiratory conditions and increases the response to allergens. NOx also contributes to the formation of fine particles (PM) and ground level ozone, both of which are associated with adverse health effects.

High levels of NOx can have a negative effect on vegetation, including leaf damage and reduced growth. It can make vegetation more susceptible to disease and frost damage. NOx also reacts with other pollutants in the presence of sunlight to form ozone which can damage vegetation at high concentrations.

The limit value objective for the protection of vegetation is 30µg/$m^3$ measured as an annual average. The values applied in the CAFÉ Directive for protection of human health are 40µg/$m^3$ for a calendar year average and 200µg/$m^3$ is not to be exceeded in any one-hour period on more than 18 times in a calendar year.

**Carbon Monoxide (CO)**

Carbon monoxide (CO) affects healthy and unhealthy people. Increased levels of carbon monoxide reduce the amount of oxygen carried by haemoglobin around the body in red blood cells. The result is that vital organs, such as the brain, nervous tissues and the heart, do not receive enough oxygen to work properly.

For healthy people, the most likely impact of a small increase in the level of carbon monoxide is that they will have trouble concentrating. Some people's coordination is affected, and they get tired more easily.

People with heart problems are likely to suffer more frequent and longer angina attacks, and would be at greater risk of heart attack. Children and unborn babies are particularly at risk because they are smaller and their bodies are still growing and developing.

The levels of carbon monoxide in the general environment is low at approximately 500 - 2000ug/$m^3$. The CAFÉ Directive has a limit applied of 10,000µg/$m^3$ which is not to be exceeded in any 8-hour period for the protection of human health. The impact on the local environmental from carbon monoxide would be negligible as the primary source would be from operational HDV. The volumes of vehicles proposed for use at this site would not be considered significant in terms of emissions.

Suspended particulate matter could also be released which tends to remain suspended in the atmosphere over longer distances. The main effects of this could be immediate impacts on site of reduced visibility and off site impact of respiratory nuisance. Dust can be generated as a result of disturbance of materials, as a result of wind speed and direction and from construction vehicles operating on site.

In general, there would be lower concentrations of dust released during the construction phase, however any earth works or deliveries of materials can give rise to dust that could be a potential nuisance off site if not adequately mitigated against.

Gaseous emissions from construction vehicles are as result of combustion of fuel, releasing $PM_{10}$, $PM_{2.5}$, $NO_x$/ $NO_2$, Carbon Monoxide and Benzene. In terms of the size and nature of this project, the concentrations of gases from the site would not be considered an air quality issue or with potential to significantly impact the AQS in the surrounding area. In the context of air pollution, the relative significance of the proposed site and surrounding areas must be taken into account. The sensitivity of an area can be defined by use of the criteria outlined in Table 8-14.

| Sensitivity | Human receptors | Ecological receptors |
|---|---|---|
| Very high | Very densely populated area.<br>More than 100 dwellings within 20m.<br>Local $PM_{10}$ concentrations exceed the objective.<br>Contaminated buildings present.<br>Very sensitive receptors (e.g. oncology units).<br>Works continuing in one area of the site for more than one year. | European Designated site. |
| High | Densely populated area.<br>10-100 dwellings within 20m of site.<br>Local $PM_{10}$ concentrations close to the objective<br>(e.g. annual mean 36-40 µg/m3).<br>Commercially sensitive horticultural land within 20m. | Nationally Designated site |
| Medium | Suburban or edge of town area.<br>Less than 10 receptors within 20m.<br>Local $PM_{10}$ concentrations below the objective (e.g. annual mean 30-36 µg/$m^3$). | Locally designated site. |
| Low | Rural area; industrial area<br>No receptors within 20m<br>Local $PM_{10}$ concentrations well below the objectives (less than 75%)<br>Wooded area between site and receptors | No designations. |

**Table 8.15 Factors Defining Sensitivity of the Area**

Given the above assessment criteria, the proposed development would be considered an area of *Medium* Sensitivity based on human factors as there are limited numbers of sensitive receptors within 20m of the proposed development and local $PM_{10}$ data is well below that allowable under the CAFE Directive for daily and annual averages. There are no designated ecological sensitive receptors (SPA or SAC's) in close proximity to the development, classifying this proposed site as low risk. However locally important habitat has been identified to the north of the site and would be categorised as medium sensitivity. The sensitivity of the local area is determined for dust soiling, human health and ecosystem impacts respectively. The following tables take account of a number of factors which may influence the sensitivity of the area surrounding the proposed development.

| Receptor Sensitivity | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|
| | | <20 | <50 | <100 | <350 |
| 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 |
| The proposed development would be classified as an area of medium sensitivity, **1-10** sensitive receptor at a distance of <20 metres from the demolition project. | | | | | |
| Classification: Medium sensitivity | | | | | |

**Table 8.16 Demolition: Sensitivity of the area to dust and soiling effects on people and property**

| **Receptor Sensitivity** | **Number of Receptors** | **Distance from the Source (m)** | | | |
|---|---|---|---|---|---|
| | | **<20** | **<50** | **<100** | **<350** |
| 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 |
| The proposed development would be classified as an area of medium sensitivity, **1-10** sensitive receptor at a distance of <20 metres from the demolition project | | | | | |
| Classification: Medium sensitivity | | | | | |

**Table 8.17 Construction: Sensitivity of the area to dust and soiling effects on people and property**

| **Receptor Sensitivity** | **Number of Receptors** | **Distance from the Source (m)** | | | |
|---|---|---|---|---|---|
| | | **<20** | **<50** | **<100** | **<350** |
| 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 |
| The proposed development would be classified as an area of medium sensitivity, **1-10** sensitive receptor at a distance of <20 metres from the demolition project | | | | | |
| Classification: Medium sensitivity | | | | | |

**Table 8.18 Earthworks: Sensitivity of the area to dust and soiling effects on people and property**

| Receptor Sensitivity | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|
| | | <20 | <50 | <100 | <350 |
| 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 |
| The proposed development would be classified as an area of medium sensitivity, **1-10** sensitive receptor at a distance of <20 metres from the demolition project | | | | | |
| Classification: Medium sensitivity | | | | | |

**Table 8.19: Trackout Sensitivity of the area to dust and soiling effects on people and property**

| Receptor Sensitivity | Annual Mean $PM_{10}$ Concentration | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|---|
| | | | <20 | <50 | <100 | <350 |
| High | >24 – 28 ug/$m^3$ | >100 | High | Medium | Medium | Low |
| | | 10 – 100 | High | Medium | Low | Low |
| | | 1 – 10 | Medium | Low | Low | Low |
| Medium | - | >10 | High | Medium | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low |
| Low | - | 1 - 10 | Low | Low | Low | Low |
| The proposed development would be classified as an area of medium sensitivity, **1-10** sensitive receptor at a distance of <20 metres from the demolition project | | | | | | |
| Classification: Medium sensitivity | | | | | | |

**Table 8.20 Demolition: Sensitivity of the Area to Human Health Impacts**

| Receptor Sensitivity | Annual Mean $PM_{10}$ Concentration | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|---|
| | | | <20 | <50 | <100 | <350 |
| High | >24 – 28 ug/$m^3$ | >100 | High | Medium | Medium | Low |
| | | 10 – 100 | High | Medium | Low | Low |
| | | 1 – 10 | Medium | Low | Low | Low |
| Medium | - | >10 | High | Medium | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low |
| Low | - | 1 - 10 | Low | Low | Low | Low |
| The proposed development would be classified as an area of medium sensitivity, **1-10** sensitive receptor at a distance of <20 metres from the demolition project | | | | | | |
| Classification: Medium sensitivity | | | | | | |

**Table 8.21: Construction: Sensitivity of the Area to Human Health Impacts**

| Receptor Sensitivity | Annual Mean $PM_{10}$ Concentration | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|---|
| | | | <20 | <50 | <100 | <350 |
| High | >24 – 28 ug/$m^3$ | >100 | High | Medium | Medium | Low |
| | | 10 – 100 | High | Medium | Low | Low |
| | | 1 – 10 | Medium | Low | Low | Low |
| Medium | - | >10 | High | Medium | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low |
| Low | - | 1 - 10 | Low | Low | Low | Low |
| The proposed development would be classified as an area of medium sensitivity, **1-10** sensitive receptor at a distance of <20 metres from the demolition project | | | | | | |
| Classification: Medium sensitivity | | | | | | |

**Table 8.22: Earthworks: Sensitivity of the Area to Human Health Impacts**

| Receptor Sensitivity | Annual Mean $PM_{10}$ Concentration | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|---|
| | | | <20 | <50 | <100 | <350 |
| High | >24 – 28 ug/$m^3$ | >100 | High | Medium | Medium | Low |
| | | 10 – 100 | High | Medium | Low | Low |
| | | 1 – 10 | Medium | Low | Low | Low |
| Medium | - | >10 | High | Medium | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low |
| Low | - | 1 - 10 | Low | Low | Low | Low |
| The proposed development would be classified as an area of medium sensitivity, with **1-10** sensitive receptors at a distance of <**2**0 metres from trackout on site**.** | | | | | | |
| Classification: Medium sensitivity | | | | | | |

**Table 8.23: Trackout: Sensitivity of the Area to Human Health Impacts**

| Receptor Sensitivity | Distance from Source (m) | |
|---|---|---|
| | <20 | <50 |
| High | High | Medium |
| Medium | Medium | Low |
| Low | Low | Low |
| The proposed development is not close to any SAC or SPA. Area identified as locally important Class C | | |
| Classification: Medium sensitivity | | |

**Table 8.24: Sensitivity of the Area to Ecological Impacts for all Works**

| Receptor Sensitivity | Sensitivity of the Surrounding Area | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Trackout |
| Dust Soiling | Medium | Medium | Medium | Medium |
| Human Health | Medium | Medium | Medium | Medium |
| Ecological | Low | Low | Low | Low |
| Overall Classification: Low to Medium | | | | |

**Table 8.25: Summary Table Defining the Sensitivity of the Area**

In order to define the risk of impacts, the sensitivity of the area is combined with the dust emissions magnitude. This will define the risk of impact with no mitigation applied.

| **Sensitivity of Area** | **Dust Emission Magnitude** | | |
|---|---|---|---|
| | **Large** | **Medium** | **Small** |
| High | High Risk | Medium Risk | Medium Risk |
| Medium | High Risk | Medium Risk | Low Risk |
| Low | Medium Risk | Low Risk | Negligible |
| Overall Classification: Medium | | | |

**Table 8.26: Risk of Impacts**

The site is classed as medium risk for dust emissions during all phases of development. The sensitivity of the area for human health and ecological effects are medium to low overall. The combined classification for risk of impacts is medium. The classification indicates the level of control and mitigation required during the different phases of development. In particular the demolition phase will require strict best practice measures and monitoring to ensure the potential for impact is negligible.

The site will operate in accordance with a Construction Environmental Management Plan. This plan includes dust control measures and monitoring procedures detailed in the appendices of this report. The mitigation measures will ensure that the development complies with the relevant EU ambient air quality standards which are based on the protection of human health. The management will include the placement of continuous dust monitors which will ensure the site is compliant. Therefore, the impact of construction of the proposed development could be negative, short-term with perceptible effects in the absence of mitigation

**Climate**

Due to the size and nature of the development, emissions of $CO_2$ and $N_2O$ from construction equipment and materials will have a negligible impact on climate change.

The impacts to climate from the construction phase of the development will be short-term, unlikely and not significant.

### 8.2.2 Operational Phase

**Air Quality & Human Health**

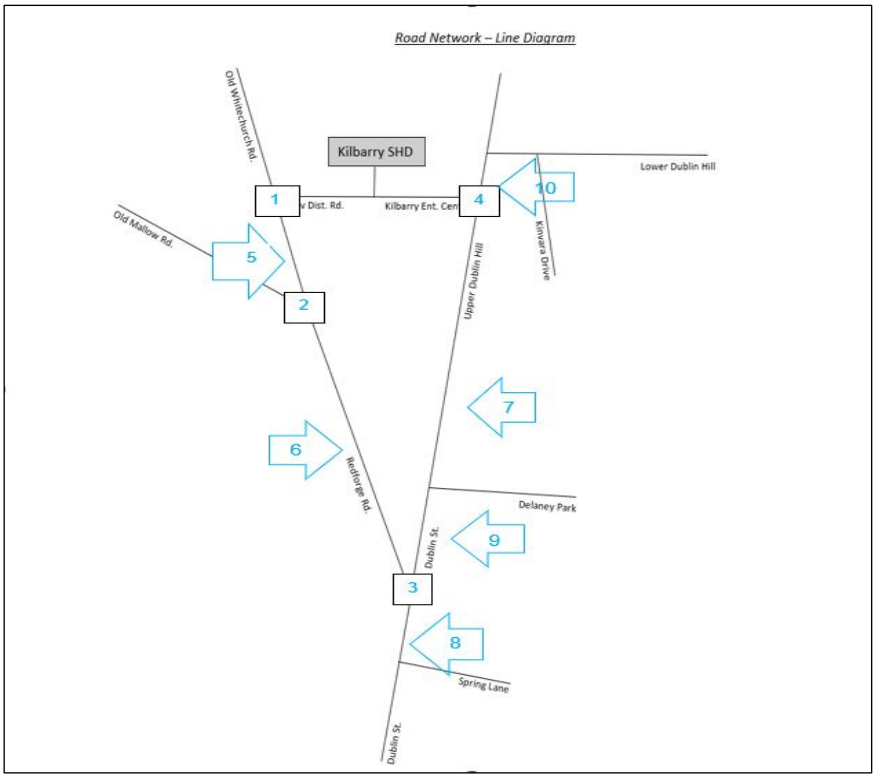
The operational phase of the proposed development will result in a slight impact on local air quality primarily as a result of the requirements of new buildings to be heated and with the increased traffic movements associated with the development.

Traffic movements associated with the development have been evaluated and assessed as part of the Traffic Impact Assessment. All link roads and junctions with the exception of Lower Dublin Hill and Upper Dublin Hill Junction will experience an increase in AADT of greater than 10%.

Modelling Assessment

Transport Infrastructure Ireland Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes detail a methodology for determining air quality impact significance criteria for road schemes and has been adopted for this assessment, as is best practice. 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, in order to determine the degree of impact.

Locations Used for Modelling Assessment




**Modelling Assessment Results – Do Nothing Scenario**

NO2

The results of the "do nothing" assessment for NO2 in the opening year are shown inTable 8-6. The predicted concentrations are below the annual limit value of 40 µg/m$^3$.

The DMRB screening assessment tool predicts annual average NO2 concentrations only and cannot predict hourly mean NO2 concentrations. However, the NRA / TII guidelines [1] state that the hourly mean standard is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m$^3$. The hourly mean NO2 concentrations for the "do nothing" scenario are therefore expected to be well below the limit value of 200 µg/m$^3$.

PM10

The results of the "do nothing" modelling assessment for PM10 in the opening year are shown in Table 8-6 and Table 8-7. Average PM10 concentrations are well below the hourly average of 40µg/m$^3$ at the closet EPA ambient monitoring station and for on-site monitoring conducted during the site visit.

PM2.5

The results of the "do nothing" modelling assessment for PM2.5 in the opening year are shown in Table 8-6 and Table 8-7. Annual average PM2.5 concentrations are well below the hourly average of 20µg/m$^3$ at the closet EPA ambient monitoring station and for on-site monitoring conducted during the site visit.

**Modelling Assessment Results – Do Something Scenario**

NO2

Traffic modelling data is predicted at peak times in order to estimate possible worst case scenario increases, in this case the time factored was 08:00 – 09:00. The DMRB screening assessment tool predicts annual average NO2 emissions only and cannot predict hourly mean NO2 concentrations. Applying the 2025 percentage increase in annual emissions to the average pollutant concentration at each location that will experience an increase of more than 10% AADT would predict that the ambient NO2 concentrations with the development in place ("do something") will all be well below the 1-hour limit of 200 µg/m$^3$ during peak traffic periods.

PM10

Traffic modelling data is predicted at peak times in order to estimate possible worst case scenario increases, in this case the time factored was 08:00 – 09:00. The DMRB screening assessment tool predicts annual average $PM_{10}$ emissions only and cannot predict hourly mean $PM_{10}$ concentrations. Applying the 2025 percentage increase in annual emissions to the average pollutant concentration at each location that will experience an increase of more than 10% AADT would predict that the ambient $PM_{10}$ concentrations with the development in place ("do something") will all be well below the 1-hour limit of 50 µg/m$^3$ during peak traffic periods.

PM2.5

Traffic modelling data is predicted at peak times in order to estimate possible worst case scenario increases, in this case the time factored was 08:00 – 09:00. The DMRB screening assessment tool predicts annual average $PM_{2.5}$ emissions only and cannot predict hourly mean $PM_{2.5}$ concentrations. Applying the 2025 percentage increase in annual emissions to the average pollutant concentration at each location that will experience an increase of more than 10% AADT would predict that the ambient $PM_{2.5}$ concentrations with the development in place ("do something") will all be well below the annual mean limit of 20 µg/m$^3$ during peak traffic periods.

The design and construction of all buildings in accordance with National Building Regulations (The Irish Building Regulations Technical Guidance Document L – Conservation of Fuel and Energy – Dwellings) shall ensure that modern building materials are used and that the build is thermally efficient. The residential developments will be heated with efficient air to water heat pumps.

The impact of the proposed development on ambient air quality and human health during the operational stage is considered long-term, localised, negative and imperceptible, therefore no mitigation is required.

**Ecological Impacts**

There are no listed ecologically sensitive sites of national or international importance in close proximity to the proposed development site. A habitat of local importance has been identified to the north of the site. An ecologist will be appointed for supervision of the construction phase and advisement on the implementation of biodiversity enhancement measures. The site was deemed low to medium risk for impact during construction and operation. The probability of effects are long-term, localised, negative and imperceptible.

**Climate Impact**

Construction of the proposed development will lead to changes in the existing local terrain, which may slightly alter wind flow patterns and localised temperatures. However, these changes are unlikely to impact on local meteorological conditions. Thus, due to the size and the nature of the proposed development the impact on microclimate during construction and operation will be negligible.

With regard to macroclimate, the dominant source of $CO_2$ emissions resulting from the proposed development during operation will be from road traffic. During the construction phase, there will be additional $CO_2$ emissions resulting from the construction activities and the embodied $CO_2$ in the construction materials.

The results of modelling the regional impact assessment of the proposed development in the opening and design years are presented in Table 8-25. The results show that $CO_2$ emissions resulting from road traffic will be equal to 89 kt $CO_2$ eq in 2025 with the proposed development in place. The increase in $CO_2$ emissions resulting from the development in the opening year is 11 kt $CO_2$ eq.

The impact of the increased road traffic $CO_2$ emissions in 2025 is equivalent to at most 0.03% of Ireland's ESD target for non-ETS emissions in 2030 and thus the impact on macroclimate will be negligible.

| Year | Scenario | CO2 Kilo Tonnes per annum |
|---|---|---|
| 2025 | Do Nothing | 78 |
| 2025 | Do Something | 89 |
| Increment in 2025 | | 11 |
| Emission Ceiling (kilo Tonnes) 2020 | | 37,943[Note1] |
| Emission Ceiling (kilo Tonnes) 2030 | | 32,860[Note 1] |
| Impact in 2030 % | | 0.03% |

**Table 8.27: Dispersion Model Results - Regional Impact Assessment**

Note 1: EU Regulation 2018/842 – Binding annual greenhouse gas 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.

The $CO_2$ emissions will not be significant in the context of Ireland's national greenhouse gas emissions inventory.

**Risk of Accidents**

There is a low risk of accidents at this site due to the level of control applied and management procedures proposed for the activity. In the event of fire at the installation there is potential for emissions of $CO_2$, $NO_x$ and combustion gases to release to atmosphere, however the impacts would be negligible given the nature of the existing site and does not contain large volumes of combustible materials. On completion, the risk of fire would be low, considering the type of installation and the levels of fire detection, suppression and protection that would be required under Health & Safety Legislation.

## 8.3 Mitigation and Monitoring Measures

### 8.3.1 Demolition/Construction Phase

In order to ensure that dust nuisance does not occur, a series of preventative measures and a dust management plan will be formulated for the demolition and construction phase of the project. The proposed measures to be implemented during the demolition / construction stage include:

- Qualitative monitoring surveys – inspections for visible dust emissions in the vicinity of the site boundary (internal and external) should be conducted daily, results be recorded in a clear manner;
- Hard surface roads are to be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic;
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be <15kph, and on hard surfaced roads as site management dictates;
- Control site traffic: vehicles delivering or removing material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;
- Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for nuisance dust emissions exist;
- Scaffolding, where required, will be erect around the site where necessary during construction along with hoardings/mesh at ground level;
- At all times, these procedures will be strictly monitored and assessed by a designated site manager;

- In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations;
- All environmentally significant raw materials (fuels, etc.) are to be stored in certified containers and tanks which are fully secured with a 'no open lid policy' in place for materials in storage. This prevents fugitive emissions and will minimise losses from the installation;
- Effective training programmes are to be implemented for construction personnel for the duration of the construction programme;
- All vehicles will be turned off when not in use;
- Works will be restricted to the times as outlined in the permission;
- A strategy for ensuring effective communication with authorities and stakeholders will be implemented;
- Adherence to the ECoW pre construction surveys and construction phase plan and CEMP>

Construction vehicles, generators etc., may give rise to some $CO_2$ and $N_2O$ emissions. However, due to the short-term and temporary nature of these works the impact on climate change will not be significant and would not require any mitigation measures.

Full details of the procedures can be found in the Construction Management Plan.

### 8.3.2 Operational Phase

Given the proposed use of this development, there are no direct sources of dust or other emissions that could give rise to nuisance or contravene any air quality standards.

There will be an increase in traffic along junctions and link roads which will have negligible impact on dust and $NO_2$ emissions once the project is completed.

### 8.3.2 Residual Effects

A comprehensive construction management programme will be required prior to demolition and construction operations commencing for the proposed project. This will minimise any impact on the local community. Normal routine operational impacts from this installation will not be significant and in line with EU Air quality standards. A summary of the residual impacts from the operational and construction phase of the development is detailed in Table 8-28.

| | Construction Phase | Operational Phase |
|---|---|---|
| **Air Quality** | Short-term, neutral, unlikely & not significant. | Long-term, localised, negative and imperceptible. |
| **Sensitive Receptors** | Short-term, neutral, unlikely & not significant. | Long-term, localised, negative and imperceptible. |
| **Ecological Receptors** | Short-term, neutral, unlikely & not significant. | Long-term, localised, negative and imperceptible. |
| **Climate** | Short-term, neutral, unlikely & not significant. | Long-term, localised, negative and imperceptible. |

**Table 8.28: Summary of Residual Effects**

### 8.4 Cumulative impacts

There are three other SHD applications underway within proximity to the proposed development site:

- ABP-312076-21: Current application for a strategic housing development comprising 275 no. residential (205 no. houses and 70 no. apartments), creche and associated site work at Ballyhooly Road, Ballyvolane.
- ABP-311819-21: Current S.5 pre-application consultation request in respect of 162 residential units (74 no. houses, 88 no. apartments), creche and associated site works at Banduff Road. Mayfield

- ABP-306325-20: Permission granted for a strategic housing development comprising 753 no. residential units (531 no. houses, 222 no apartments), creche and associated site works at Longview, off the Ballyhooley Road.

Even if the construction phases of these projects coincide for a period of time with that of the proposed development, given their temporary nature, the likelihood of any significant cumulative effect on air quality is low and short term.

No cumulative effects on air quality or climate are predicted to arise from the proposed development during the operational phase.

### 8.5 Interactions

The generation of traffic during the construction and operation stages of the development leads to increased vehicle emissions and thereby interacts with air quality and climate.

The effects on air quality standards of the project during construction and operational phases and the resultant interaction with human health and ecology have been shown to be negligible.

### 8.6 Difficulties in compiling information

There were no difficulties encountered in compiling this section of the EIAR.

### 8.7 References

Air Quality Standards Regulations, 2011 (SI. No. 180 of 2011) The Stationary Office, Dublin, Ireland,
Climate Action and Low Carbon Development Act, 2015.
Department of Communications, Climate Action & Environment; National Adaption Framework (January 2018), Planning for a Climate Resilient Ireland.
Department of Communications, Climate Action & Environment, National Adaption Framework (December 2012), Building Resilience to Climate Change
Department of Communications, Climate Action and Environment; National Mitigation Plan (July 2017)
Department of Communications, Climate Action & Environment; National Renewable Energy Action Plan (December 2017)
Department for Environment, Food and Rural Affairs (UK) (2007) Design Manual for Roads and Bridges (DMRB) Screening Metho (Version 1.03c) spreadsheet

EC Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 (amended by Commission Directive (EU) 2015/1480 of 28 August 2015) on ambient air quality and cleaner for Europe
Environmental Protection Agency (2018) Air Quality in Ireland 2017.
Environmental Protection Agency (2017) Air Quality in Ireland 2016.
Environmental Protection Agency (2016) Air Quality in Ireland 2015.
Environmental Protection Agency (2006) Environmental Management in the Extractive Industry (Non-Scheduled Minerals).
Environmental Protection Agency (EPA) (May 2018) ''Irelands Greenhouse Gas Emissions Projections' 2017-2035
EU Regulation 2018/842 – Binding annual greenhouse gas emission reductions by Member States from 2021-2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013.
Environmental Protection Agency (2021) Ireland's Provisional Greenhouse Gas Emissions 1990-2020.

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## 9.0 NOISE & VIBRATION

**Content** **Page**



**Figures, Plates and Tables**

## 9.1 Introduction

Planning Permission is currently being sought for a residential development that is proposed to be constructed on what is currently greenfield lands located in Kilbarry, Co. Cork. The proposed development will consist of a strategic housing development of 319 no. residential dwellings comprising of 85 no. semi-detached units (comprising of 17 no. 4-bed units and 68 no. 3-bed units), 118 no. terraced units (comprising of 8 no. 4-bed units, 60 no. 3-bed units and 50 no. 2-bed units), 53 no. duplex units (comprising of 26 no. 1-bed units, 25no. 2-bed units and 2 no. 3-bed units) and 63 no. apartments (in 3 no. part 4 storey and part 5-storey blocks and comprising 15 no. 1-bed units and 48 no. 2-bed units). The development also includes the provision of a crèche facility (519 sqm) and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is 33,738.70 sqm.

The proposed development will also consist of the demolition of a disused hurley manufacturing factory and associated out buildings, the removal and replacement of the southern and eastern boundary treatments, as well the creation of formalised walking paths to replace the informal walking paths located to the north of the site, a new through road from the proposed site access on the Old Whitechurch Road to Delaney's GAA Grounds and accessing the Upper Dublin Hill Road, with associated new boundary treatments at Delaney's GAA club, all associated ancillary site development and hard and soft landscaping works, to include the provision of private, communal and public open space, waste storage areas, bicycle, motorcycle and car parking, including EV and disabled parking, esb substations, groundworks, foul drainage works, stormwater drainage proposals including directional drilling for the stormwater outfall, water supply proposals, public lighting, and all new boundary treatments.

CLV Consulting Limited has been commissioned by Coakley O'Neill Town Planners to conduct an assessment of the likely noise and vibration impact associated with the development. This assessment has been detailed in the following document.

### 9.1.1 Chapter author

This Chapter has been prepared by Brian S. Johnson (B Sci, MIOA) who is an Acoustic Specialist with CLV Consulting, a multidisciplinary acoustic and vibration consultancy offering specialist design and assessment advice in respect of Environmental and Architectural / Building Acoustics.

Brian is an internationally experienced acoustic consultant who has been working in the fields of architectural and environmental acoustics and noise control since 1994. He has been based in America, Europe, Asia and Australia and is a corporate member of the Institute of Acoustics.

Brian has extensive knowledge in the field of environmental acoustics and holds a Certificate of Competence in Environmental Noise Measurements from the Institute of Acoustics.

### 9.1.2 Chapter context

This chapter of the EIAR describes the likely noise and vibration impact that is expected to be associated with both the construction and operational phases of the proposed development.

It 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 on its surrounding environment.
The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

### 9.1.3 Assessment methodology

The assessment of impacts has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this chapter. In addition to specific guidance documents for the assessment of noise and vibration impacts which are discussed further in the relevant sections, the following guidelines were considered and consulted for the purposes of this chapter:

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports Draft August 2017
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

In order to assess the potential for noise impacts from the development, the following assessment methodology was employed:

- Noise measurements were conducted at the nearest identified noise sensitive receptors in order to quantify the ambient noise level environment in the vicinity of the proposed development.

- The measured ambient noise levels were used to establish construction maximum noise emission criteria limits and for comparison purposes with operational noise emissions to confirm that development noise emissions will be below the existing ambient noise levels in the vicinity of the proposed development once operational.

- Construction noise emission levels were calculated in accordance with BS 8233:2014 at each of the nearest noise sensitive receptors based on sound power / pressure levels for expected equipment / processes along with standard appropriate corrections for attenuation with distance, screening from buildings / perimeter site hoarding and the presence of nearby reflecting surfaces.

- Operational noise emission levels were calculated in accordance in a similar fashion at each of the nearest noise sensitive receptors based on all identified operational noise source sound power / pressure levels along with standard appropriate corrections for attenuation with distance, screening from buildings / perimeter site hoarding and the presence of nearby reflecting surfaces.

- The cumulative results of these calculations were then used to assess the potential for a noise impact based on a comparison with both criteria limits and existing ambient noise levels at the nearest noise sensitive receptors.

## 9.2 Description of Baseline / Existing Environment

As stated in the Introduction section, the proposed development is a strategic housing development located on existing greenfield sites in Kilbarry, Co. Cork, just to the north of Cork city. The proposed site is bordered to the west by residential dwellings located along Old Whitechurch Road, to the east by the Delany Rovers GAA Club, to the south by City North Business Park and to the north by greenfield sites.

The nearest noise sensitive receptors to the proposed development are the detached residential dwellings located along Old Whitechurch Road and, to a much lesser extent, the GAA clubhouse building and City North Business Park office building.

See Figure 9.1 on the following page.

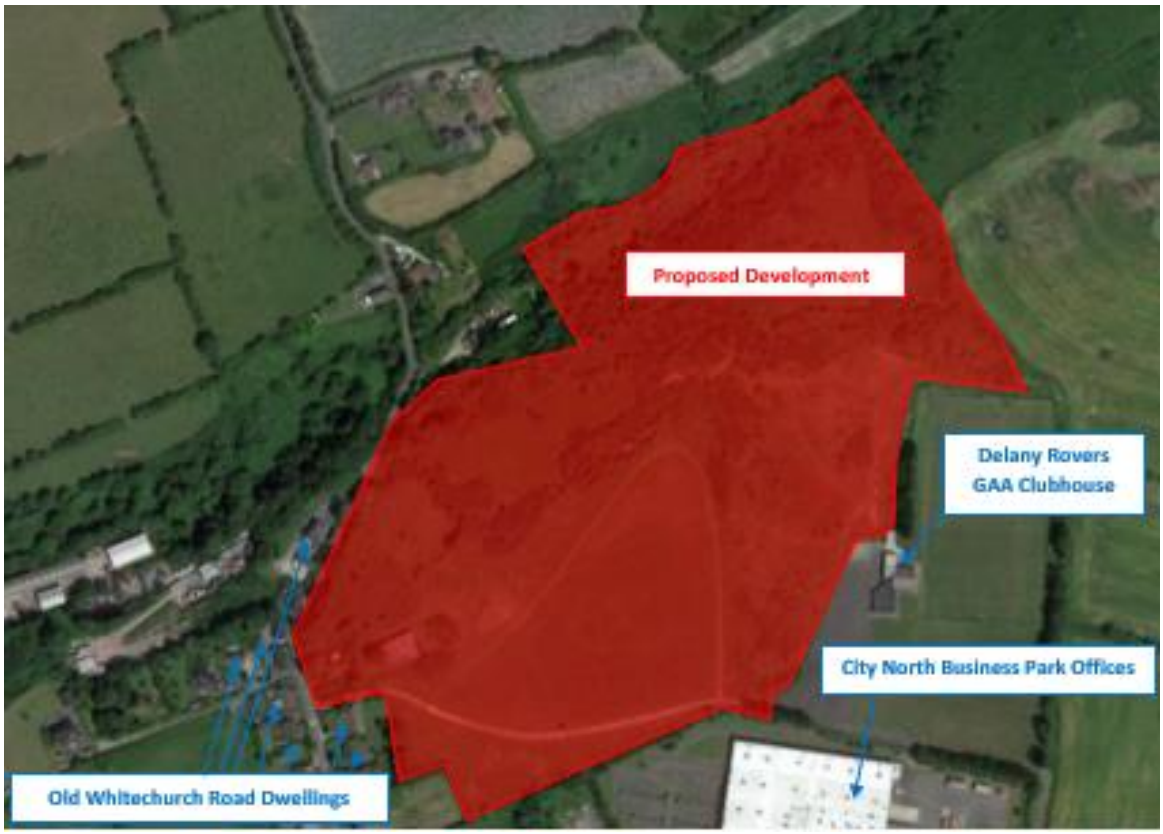


**Figure 9.1: Proposed Development Location & Nearest Noise Sensitive Receptors**

## 9.3 Receiving Environment

An environmental noise survey was conducted in order to quantify the existing noise environment in the vicinity of the proposed development. The survey was conducted in general accordance with *ISO 1996-2: 2017: Acoustics - Description, measurement, and assessment of environmental noise*.

Specific details are set out below.

### 9.3.1 Choice of Measurement Locations

Three measurement locations were selected; each is described in turn below and shown in Figure 9.2 on the following page.

**Location 1** is located adjacent to the rear gardens of the dwellings located along Old Whitechurch Road near the barricaded site entrance to the Delaney Rovers GAA Club. The noise levels measured at this location would be indicative of the ambient noise environment of the dwellings along Old Whitechurch Road to the southwest of the proposed development.

**Location 2** is located adjacent to the rear gardens of the dwellings located along Old Whitechurch Road to the west of the proposed development.

**Location 3** is located in the vicinity of the Delany Rovers GAA Clubhouse.


**Figure 9.2: Site Layout Showing Approximate Positions of Measurement Locations 1, 2 & 3**

### 9.3.2 Survey Periods

Noise measurements were conducted over the course of three survey periods as follows:

**Measurement Locations #1 & 2**

- Daytime 11:35 to 13:35 hrs 26 May 2022;
- Night-time 23:00 to 01:00 hrs 26 / 27 May 2022.

**Measurement Location #3**

- Daytime 12:30 to 13:15 hrs 1 June 2022;

The daytime measurements cover periods that were selected in order to provide a typical snapshot of the existing noise climate, with the primary purpose being to ensure that the proposed noise criteria associated with the development are commensurate with the prevailing environment.

The night-time period provides a measure of the existing background noise levels.

The weather during the Measurement Locations #1 & 2 daytime survey periods was 16 - 17$^0$C and partly cloudy and dry with 3 - 4m/s winds from the west / southwest. The weather during the Measurement Locations #1 & 2 night time survey was 8$^0$C and cloudy with 1m/s winds from the west.

The weather during the Measurement Location #3 daytime survey period was 15$^0$C and mostly sunny and dry with 1 - 2m/s winds from the south / southeast.

### 9.3.3 Personnel & Instrumentation

Brian S. Johnson (CLV) conducted the noise level measurements during all survey periods. The measurements were conducted using an NTI Audio type XL2 Sound Level Meter (Serial #A2A-11070-EO). It was fitted with a 90mm windshield the measurement apparatus was check calibrated both before and after the survey using a Casella Cel 120 Acoustic Calibrator (Serial #5072087). The microphone was positioned approximately 1.4m above the ground.

The calibration certificates for the sound level meter and acoustic calibrator are provided in the Appendices of this EIAR.

### 9.3.4 Procedure

Measurements were conducted at each Measurement Locations 1 & 2 on a cyclical basis. Sample periods for the noise measurements were 15 minutes during both the daytime and night-time periods. The results were saved to the instrument memory for later analysis. All primary noise sources contributing to noise build-up were also noted.

Measurements conducted at Measurement Location 3 were conducted during successive periods due to limited access periods. Noise measurements were 15 minutes during the daytime period (the GAA Clubhouse is only in operation during daytime periods so night time measurements were not required in this instance). The results were saved to the instrument memory for later analysis. All primary noise sources contributing to noise build-up were also noted.

### 9.3.5 Measurement Parameters

The noise survey results are presented in terms of the following five 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.
- **$L_{Amax}$** is the instantaneous maximum sound level measured during the sample period.
- **$L_{Amin}$** is the instantaneous minimum sound level measured during the sample period.
- **$L_{A10}$** is the sound level that is exceeded for 10% of the sample period.
- **$L_{A90}$** 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 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 2x10-5 Pa.

### 9.3.6 Measurement Results

**Location 1**

The survey results for Location 1 are summarised in Table 9.1 on the following page.

| Period | Time | Measured Noise Levels (dB re. 2x10-5 Pa) | | | | |
|---|---|---|---|---|---|---|
| | | $L_{Aeq}$ | $L_{Amax}$ | $L_{Amin}$ | $L_{A10}$ | $L_{A90}$ |
| Daytime | 11:35 - 11:50 hrs | 49 | 67 | 41 | 50 | 43 |
| | 12:15 - 12:30 hrs | 48 | 66 | 41 | 50 | 44 |
| | 13:00 - 13:15 hrs | 49 | 63 | 41 | 52 | 43 |
| Night Time | 23:00 - 23:15 hrs | 38 | 65 | 22 | 40 | 26 |
| | 23:40 - 23:55 hrs | 37 | 55 | 22 | 38 | 25 |
| | 00:25 - 00:40 hrs | 37 | 42 | 21 | 37 | 25 |

**Table 9.1: Summary of Measured Noise Levels at Location 1**

During daytime monitoring periods, the dominant source of noise observed in the vicinity was from local traffic along Old Whitechurch Road and other nearby road networks. Some low level wind generated noise and birdsong / insect noise also contributed as well as distant reversing alarms from the pallets recycling facility. Daytime noise levels were in the range 48 to 49dB $L_{Aeq}$ and 43 to 44dB $L_{A90}$.

The night-time noise measurements at this location were again dominated by traffic noise along Old Whitechurch Road and other nearby and distant road networks. Some wind generated noise and distant building services noise from the City North Business Park were also contributors. Noise levels were in the range 37 to 38dB $L_{Aeq}$ and 25 to 26dB $L_{A90}$.

**Location 2**

The survey results for Location 2 are summarised in Table 9.2 below.

| Period | Time | Measured Noise Levels (dB re. 2x10-5 Pa) | | | | |
|---|---|---|---|---|---|---|
| | | $L_{Aeq}$ | $L_{Amax}$ | $L_{Amin}$ | $L_{A10}$ | $L_{A90}$ |
| Daytime | 11:55 - 12:10 hrs | 58 | 80 | 48 | 58 | 49 |
| | 12:40 - 12:55 hrs | 51 | 70 | 47 | 52 | 48 |
| | 13:20 - 13:35 hrs | 53 | 76 | 47 | 54 | 48 |
| | 23:20 - 23:35 hrs | 36 | 61 | 23 | 37 | 26 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Night Time** | 00:00 - 00:15 hrs | 36 | 60 | 23 | 37 | 26 |
| | 00:45 - 01:00 hrs | 36 | 44 | 23 | 36 | 25 |

**Table 9.2: Summary of Measured Noise Levels at Location 2**

During daytime monitoring periods, the dominant source of noise observed in the vicinity was from the pallet recycling facility (i.e. forklift activity, vehicle movements and reversing alarms). Local traffic along Old Whitechurch Road and birdsong / insect noise also contributed. Daytime noise levels were in the range 51 to 58dB $L_{Aeq}$ and 48 to 49dB $L_{A90}$.

The night-time noise measurements at this location were dominated by traffic noise along Old Whitechurch Road and other nearby and distant road networks. Some wind generated noise also contributed. Noise levels were of the order of 36dB $L_{Aeq}$ and 25 to 26dB $L_{A90}$.

**Location 3**

The survey results for Location 3 are summarised in Table 9.3 below.

| Period | Time | Measured Noise Levels (dB re. 2x10-5 Pa) | | | | |
|---|---|---|---|---|---|---|
| | | $L_{Aeq}$ | $L_{Amax}$ | $L_{Amin}$ | $L_{A10}$ | $L_{A90}$ |
| **Daytime** | 12:30 - 12:45 hrs | 42 | 62 | 33 | 43 | 36 |
| | 12:45 - 13:00 hrs | 41 | 53 | 34 | 44 | 35 |
| | 13:00 - 13:15 hrs | 40 | 51 | 33 | 43 | 35 |

**Table 9.3: Summary of Measured Noise Levels at Location 3**

During daytime monitoring periods, the dominant source of noise observed in the vicinity was from distant road networks and activity noise from the industrial facilities located to the southeast. Some low level wind generated noise and birdsong / insect noise also contributed. Daytime noise levels were in the range 40 to 42dB $L_{Aeq}$ and 35 to 36dB $L_{A90}$.

## 9.4 Noise & vibration impact assessment criteria

### 9.4.1 Construction phase noise criteria

There is no published statutory Irish best practice guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project (other than for roadways). Local authorities normally control construction activities by imposing limits on the hours of operation and may consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the British Standard *BS 5228 - 1: 2009+A1: 209 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Part 1: Noise*.

The approach adopted here 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. This then sets a threshold noise value that, if exceeded, indicates a significant noise impact is associated with the construction activities.

Table 9.4 below sets out the values which, when exceeded, indicate a significant effect at the facades of residential receptors as recommended by *BS 5228 - 1*. Please note that these are cumulative levels, i.e. the sum of both ambient and construction noise levels.

| Period | Threshold Value, Decibels (dB) | | |
|---|---|---|---|
| | Category A [A] | Category B [B] | Category C [C] |
| **Night-Time (23:00 to 07:00hrs)** | 45 | 50 | 55 |
| **Evenings & Weekends [D]** | 55 | 60 | 65 |
| **Daytime (07:00 - 19:00) & Saturdays (07:00 - 13:00)** | 65 | 70 | 75 |

**Table 9.4: Example Threshold of Significant Effect at Dwellings**

Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.
19:00 - 23:00 weekdays, 13:00 - 23:00 Saturdays and 07:00 - 23:00 Sundays.

For the appropriate period (e.g. daytime), the ambient noise level is determined and rounded to the nearest 5dB.

In this instance, the nearest residential properties are the dwellings located along Old Whitechurch Road to the west. Daytime ambient noise levels measured at these locations were in 48 to 58dB $L_{Aeq}$ at these locations. All of these dwellings would therefore be applied with a Category A designation.

It should also be noted that the established noise emission criterion detailed above is for residential dwellings. For construction noise impact on the less acoustically sensitive GAA clubhouse and office building, a 10dB relaxation of the applicable residential criteria is typically applied which would result in a Category C designation.

The maximum daytime criteria limits in Table 9.5 will therefore be applied at the adjacent noise sensitive receptiors in respect of construction noise emissions from the proposed development. If the total noise level (i.e. construction noise plus existing ambient noise level) exceeds the appropriate category values then a relative noise impact is deemed to have occurred.

| Adjacent Noise Sensitive Receptor Location | Threshold Value, Decibels (dB $L_{Aeq}$) | | |
|---|---|---|---|
| | Daytime Periods (07:00 - 19:00) & Saturdays (07:00 - 13:00) | Evening Periods* 19:00 - 23:00 Weekdays 13:00 - 23:00 Saturdays & 07:00 - 23:00 Sundays | Night Periods* (23:00 to 07:00hrs) |
| Residential Dwellings | 65 | 55 | 45 |
| GAA Clubhouse / Office Building | 75 | 65 | 55 |

**Table 9.5: Established Threshold / Maximum Construction Noise Criteria Limits for Proposed Development**

* Note: Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

The levels set out in Table 9.5 are also generally consistent with the levels recommended in *BS 5228-1:+A1:2014 (Code of practice for noise and vibration control on construction and open sites Part 1: Noise)* for setting limits for noise emissions from a construction site.

### 9.4.2 Operational phase noise criteria

Due consideration must be given to the nature of the primary noise sources when setting noise emissions criteria. In this instance, there are four primary sources of noise associated with the development once operational. Criteria for noise from all of these sources, will be considered in terms of the $L_{Aeq,T}$ parameter (the equivalent continuous sound level).

There is no Irish Standard containing guidance for appropriate noise limits in this instance. In the absence of such standards, best practice dictates that the potential noise impact of the proposed development is assessed against appropriate British and/or International Standards.

Appropriate guidance is contained within BS 8233 (2014): Guidance on Sound Insulation and Noise Reduction for Buildings. This British Standard sets out recommended noise limits for indoor ambient noise levels in residential dwellings as detailed in Table 9.6 below.

| Activity | Room Type | Design Criterion (dB $L_{Aeq}$) | |
|---|---|---|---|
| | | Daytime (07:00 - 23:00hrs) | Night Time (23:00 - 07:00hrs) |
| Resting / Sleeping Conditions | Living Rooms | 35dB $L_{Aeq,16hr}$ | - |
| | Bedrooms | 35dB $L_{Aeq,16hr}$ | 30dB $L_{Aeq,8hr}$ |

**Table 9.6: Recommended Indoor Ambient Noise Levels from BS8233 (2014)**

For the purposes of this assessment, it is necessary to derive external limits based on the internal criteria noted in the paragraph above. This is done by factoring in a degree of noise reduction afforded by an open window, which is defined in the standard as being 15dB.

Applying the 15dB factor to the values from the BS8233 table, the following criteria would apply at the façades of the adjacent dwellings:

- *Daytime (07:00 to 23:00 hours)* *50dB $L_{Aeq,16hr}$*
- *Night-time (23:00 to 07:00 hours)* *45dB $L_{Aeq,8hr}$*

These criteria are also in compliance with the following guidance taken from the World Health Organisation publication "Community Noise".

> *To protect the majority of people from being moderately annoyed during the daytime, the sound pressure level should not exceed 50dB $L_{Aeq}$.*
>
> *At night external sound pressure levels should not exceed 45dB $L_{Aeq}$, so that people may sleep with bedroom windows open.*

In consideration of the adjacent GAA Clubhouse / office buildings, there is no specific criteria guidance for provided in BS 8233 as these building types are usually not generally considered to be similar to dwellings in terms of noise sensitivity. However, the standard does list 'typical' internal noise level design ranges of 35 - 40dB $L_{Aeq}$ for executive offices which could be considered applicable as a worst case condition for both building types. We have therefore applied an internal noise emission criterion of 35dB $L_{Aeq}$ in this instance. Applying the same 15dB open window / door correction was also applied to obtain an external noise criterion of 50dB $L_{Aeq}$.

In order to assist with the interpretation of the noise associated with changes in noise level due to increases in road traffic, Table 9.7, on the following page, offers guidance as to the likely impact associated with any particular relative change.

| **Change in Sound Level (dB $L_{Aeq}$)** | **Subjective Reaction** | **Impact** |
|---|---|---|
| < 3 | Inaudible | Imperceptible |
| 3 - 5 | Perceptible | Slight |
| 11 - 15 | Over a doubling of loudness | Significant |
| > 15 | | Profound |

**Table 9.7: Likely Impact Associated with Change in Noise Level**

### 9.4.3 Vibration guidelines

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short duration. For example, blasting and piling, two of the primary sources of vibration during construction, are typically tolerated at vibration levels up to 12mm/s and 5mm/s respectively. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant of such activities during the night.

Guidance relevant to acceptable vibration within buildings is contained in the following documents:

- *British Standard BS 7385 (1993): Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration*, and;

- *British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 2: Vibration.*

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz and 50mm/s at 40Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

BS 5228 recommends that, for soundly constructed residential property, light commercial buildings and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak particle velocity of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and increasing to 50mm/s at 40Hz and above for intermittent vibration. For reinforced or framed structures or industrial and heavy commercial buildings and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak particle velocity of 50mm/s at 40Hz and above again for intermittent vibration. In the case of continuous vibration, it states that these figures may need to be reduced by up to 50%. Below these vibration magnitudes minor damage is unlikely, although where there is existing damage, these limits may be reduced by up to 50%.

## 9.5 Potential noise & vibration impact of the proposed development

### 9.5.1 Do nothing scenario

If the proposed development does not go ahead, the ambient noise environment in the vicinity of the development would likely remain the same going forward, albeit with a slight increase over time due to traffic volumes that increases organically over time.

### 9.5.2 Potential noise & vibration impacts

**Construction phase**

A variety of items of plant will be in use during the construction phase of the proposed development, such as excavators, lifting equipment, dumper trucks, compressors and generators. There will be vehicular movements to and from the site that will make use of both existing roads and the new internal roads.

Due to the nature of the activities undertaken on a large construction site, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Considering the relatively good shape of the road as well as its lack of speed ramps and the current traffic use on surrounding roads, there is little likelihood of structural or even cosmetic damage to existing nearby dwellings.

Due to the fact that the construction programme has been established in outline form only, it is difficult to calculate the actual magnitude of noise emissions to the local environment. However, it is possible to predict typical noise levels using guidance set out in *BS 5228 - 1: 2009+A1: 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Part 1: Noise*.

The Old Whitechurch Road residential dwellings are located along the western boundary of the site at a distance of the order of 20m from the proposed development building facades at the nearest point. The Delany Rovers GAA clubhouse is approximately the same distance at its nearest point and the nearest City North Business Park office building (Flex) is located at an approximate distance of 45m away.

It must be stated that for the majority of the time, plant and equipment will be at a greater distance from these buildings than that used for the calculations and consequently will have lesser impact. Our assessment would therefore be representative of a "worst-case" scenario that considers construction works conducted at the proposed dwellings located around the perimeter of the development.

The following assumptions have been made in the preparation of these construction noise predictions:

- a utilisation of equipment of 75% over a working day;
- construction site along the perimeter development boundary will be screened by site hoarding a minimum of 2m in height.

| Phase | Plant Item (BS 5228 Ref) | Plant Noise Level at 10m Distance (dB $L_{Aeq}$) | Predicted Noise Level (dB $L_{Aeq,1hr}$) at: | | |
|---|---|---|---|---|---|
| | | | Old Whitechurch Road Dwellings | Delany Rovers GAA Clubhouse | City North Business Park Offices |
| Site Preparation | Tracked excavator (C3.92) | 76 | 66 | 66 | 54 |
| | Dumper (C3.100) | 74 | | | |

| Phase | Plant Item (BS 5228 Ref) | Plant Noise Level at 10m Distance (dB $L_{Aeq}$) | Predicted Noise Level (dB $L_{Aeq,1hr}$) at: | | |
|---|---|---|---|---|---|
| | | | Old Whitechurch Road Dwellings | Delany Rovers GAA Clubhouse | City North Business Park Offices |
| **Foundation Laying** | Compressor (C6.19) | 72 | 65 | 65 | 53 |
| | Poker Vibrator (C6.40) | 73 | | | |
| | Cement Mixers (C6.6) | 71 | | | |
| **General Construction** | Compressor (C7.70) | 70 | 67 | 67 | 55 |
| | Diesel Hoist (C7.97) | 73 | | | |
| | Pneumatic Circular Saw (C.79) | 75 | | | |
| | Generator (C7.51) | 72 | | | |
| **Roadworks** | Surfacing | 73 | 64 | 64 | 53 |

**Table 9.8: Likely Impact Associated with Change in Noise Level**

All of the predicted noise levels are below the Table 9.5 established criteria for construction activities at the GAA clubhouse and City North offices. There should therefore be no significant disturbance caused to these noise sensitive receptors.

During the Site Preparation and General Constructions phases, there are likely to be slight exceedances of the criteria by 1 - 2dB(A) at the nearest Old Whitechurch Road dwellings. However, these exceedances would be considered slight and will be very in nature. We would therefore only recommend that construction works are restricted to daytime periods and that the recommended guidance for reducing construction noise emissions in Section 9.6.1 is followed in order to ensure that noise emissions occurring during these phases are reduced as far as practical.

With respect to vibration impact, the potential for vibration at the majority of neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces (we note that there is no blasting planned in the site preparation for the development). The more significant of these is the vibration from excavation operations; the method of which will need to be selected and controlled to ensure there is no likelihood of structural or even cosmetic damage to existing neighbouring dwellings. However, the relative distance between the excavation areas and the existing residences is such that any ground borne vibration should be well below threshold limits.

**Operational phase**

There are four principal sources of noise which are expected to arise during the operational phase of the proposed development:

- ✓ Activity noise from the proposed creche;
- ✓ car parking activity;
- ✓ vehicular traffic on new internal roads; and
- ✓ additional vehicular traffic on surrounding public roads.

Each of these primary noise sources is addressed in turn in the following sections.

**Activity noise from the creche**

Noise from creches are primarily in the form of children playing and engaging in other outdoor activities. In this instance, that will occur in the small outdoor play area at the rear of the building. The development creche is proposed to locate in the southwestern corner of the development adjacent to the rear gardens of a few of the Old Whitechurch Road residential dwellings. In order to minimise noise impact from the creche on these dwellings, a 2m high boundary wall is proposed to be provided along the boundary between the creche's small outdoor play area and these dwellings. This boundary wall will be further supplemented with trees planted adjacent to the boundary wall (on the creche side) to provide further noise shielding / diffusion / masking for the dwellings.

Noise emission levels measured children shouting / exclamatory voices measured during simulated conditions are of the order of 89dB $L_{Amax}$ and 78dB $L_{Aeq}$ when measured at a distance of 1m from source. The nearest Old Whitechurch Road dwelling is located at a distance of approximately 25m to the west.

Average noise emission levels from the creche playground were calculated and predicted at a level of the order of 48dB $L_{Aeq}$ at the nearest dwelling. A level of this order would be within the daytime noise criteria (the creche will not be in operation during night time hours) as well as being consistent with or below the daytime ambient noise levels measured at this location (refer to Table 9.1).

Maximum noise emission levels from the creche playground predicted at the nearest dwelling resulted in a level of the order of 60dB $L_{Amax}$. Although there is no maximum noise level criterion for daytime periods, a level of this order would be consistent with or below the 63 to 67dB $L_{Amax}$ measured during daytime periods.

Although it is acknowledged that noise emissions from the creche will alter the current characteristic of the ambient noise environment in its vicinity, given that the predicted noise level emission predictions from the creche will be both within criteria and consistent with or below the existing noise levels at the nearest noise sensitive locations, the likely amount of noise transmission to the local environment would therefore not be considered sufficient to constitute a significant noise impact.

The only mitigation measures that would be deemed as being required in this instance is a minimum 2m high boundary noise barrier wall and supplemental tree planting along the western boundary line.

**Car parking on site**

The car-parking facilities for the development will consist of surface level spaces in driveways and in front of homes / buildings. Given the large amount of land area that the development comprises, the vast majority of surface car park spaces will be in the interior of the development and therefore shielded by the development dwellings themselves. The areas that are exposed to development external locations are very minimal and will therefore experience minimal activity over the course of the day.

Taking into account the shielding from the development dwellings and attenuation due to distance, noise levels from residential car parking along the vast majority of the development boundary should not raise the ambient noise level at any nearby noise sensitive location to any measurable degree at any of the adjacent noise sensitive receptors and will be similar in characteristic to the ambient noise environment at each.

The likely amount of noise transmission from car park activities to the local environment is therefore not expected to exceed criteria or result in any significant increase in noise level.

**Vehicular traffic on new internal roads**

The proposed development includes a new main distributor road that runs along the southern boundary of the development from Old Whitechurch Road. This road serves a number of small branch roads within the central portion of the proposed development. Given that these branch roads will be much less trafficked than the main distributor road and are all located more internally (and therefore screened), the relative noise impact of the smaller branch roads would be negligible in comparison. The noise impact of this main distributor road on the nearest noise sensitive receptors is therefore addressed in the following paragraphs.

The noise level associated with an event of short duration, such as a vehicle drive-by, may be expressed in terms of its Sound Exposure Level (SEL). The SEL can be used to calculate the contribution of an event or series of events to the overall noise level in a given period.

The appropriate formula is given below.

$$\mathbf{L_{Aeq,T} = SEL + 10log_{10}(N) - 10log_{10}(T) \quad dB}$$

where: $L_{Aeq,T}$ is the equivalent continuous sound level over the time period T (s);
SEL is the "A-weighted" Sound Exposure Level of the event under consideration (dB);
N is the number of events over the course of time period T.

The mean value of a Sound Exposure Level for a car movement, at low to moderate speeds, is of the order of 65dB(A) at a distance of 5m from the edge of the road. This figure is based on a series of measurements conducted under controlled conditions. According to traffic figures provided by MHL Consulting Engineers, the predicted AADT traffic volume for the main distributor road is 2,707. It is assumed that approximately 85% of these traffic volumes will occur during daytime periods.

Using the method outlined above, distributor road noise emission levels have been predicted at these noise sensitive locations. The results are shown in below.

| | **Daytime** | **Night Time** |
|---|---|---|
| ➢ Old Whitechurch Road Dwellings | 49dB $L_{Aeq,16hr}$ | 42dB $L_{Aeq,8hr}$ |
| ➢ Delany Rovers GAA Clubhouse | 16dB $L_{Aeq,16hr}$ | < 10dB $L_{Aeq,8hr}$ |
| ➢ City North Office Building | 28dB $L_{Aeq,16hr}$ | 20dB $L_{Aeq,8hr}$ |

Levels of this order would be within both the daytime and night time noise criteria. No additional mitigation measures are therefore required in respect of the new internal roads.

**Additional vehicular traffic on public roads**

The proposed development will introduce some additional traffic onto public roads in the locality of the site. The traffic flow information was provided by MHL Consulting Engineers for the road networks shown in Figure 9.3 (on the following page) during the opening year 2025.

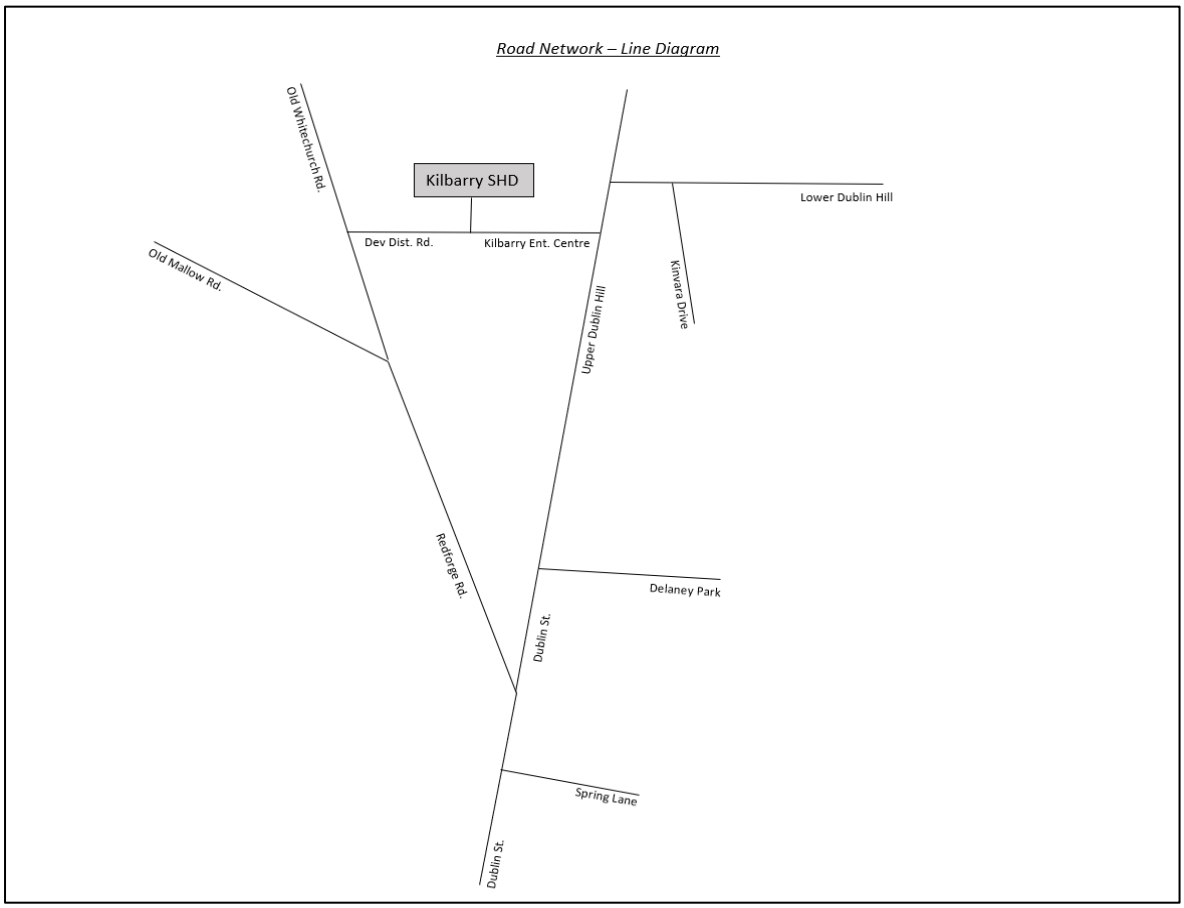


**Figure 9.3: Proposed Development Adjacent Road Networks**

The results of our analysis based on this information are presented in Tables 9.9 below.

| Roadway | 2025 AADT | | Change in Noise Level (dB) |
|---|---|---|---|
| | Without Development | With Development | |
| Old Whitechurch Rd. | 652 | 2146 | + 5.2 |
| Redforge Rd. | 6325 | 7504 | + 0.7 |
| Dublin St. | 13414 | 14076 | + 0.2 |
| Lower Dublin Hill | 6626 | 6791 | + 0.1 |
| Upper Dublin Hill | 11102 | 11657 | + 0.2 |

**Table 9.9: Change in Traffic Noise Level for the Opening Year 2025**

The differences between predicted traffic flows with and without the site are such that the resulting increase in noise levels is < 1.0 dB at receptors adjacent to most of the surrounding road networks. The impact of this increase is therefore considered to be imperceptible and therefore negligible.

The only exception are the receptors located along Old Whitechurch Road to the south of the development which are expected to experience a 5dB increase in noise level. An increase in noise level of this order would result in a slight noise impact to these residential dwellings.

Given the proximity of the dwellings in this area to the road, there are no practicable mitigation measures that could be provided in this instance. However, a 5dB increase in noise level would not be sufficient to increase roadway noise emissions from Old Whitechurch Road to near or above the minimum threshold criteria detailed in the National Roads Authority's (NRA) *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* document.

No additional mitigation measures would therefore be deemed as being required in this instance.

## 9.6 Mitigation measures, Monitoring and Residual Impacts

### 9.6.1 Mitigation & Monitoring

**Construction Phase**

The scheme contractor will be obliged to give due regard to BS5228, which offers detailed guidance on the control of noise from construction activities. In particular, it is proposed that various practices be adopted during construction, including:

- limiting the hours during which site activities likely to create high levels of noise are permitted;
- establishing channels of communication between the contractor / developer, local authority and residents;
- appointing a site representative responsible for matters relating to noise;
- ensuring all site access roads are kept as even as possible so as to mitigate the potential for vibration from lorries;
- monitoring typical levels of noise during critical periods and at sensitive locations (at representative locations along the perimeter of the development only).

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed, including:

- selection of plant with low inherent potential for generation of noise;
- siting of noisy plant as far away from sensitive properties as permitted by site constraints.
- provision of 2m high hoarding to block line of sight with adjacent dwellings located along the perimeter of the development.

Vibration from construction activities will be limited to the values set out in Table 9.10 (on the following page) but will likely be far below these values. It should be noted that these limits are not absolute but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Where there is existing damage, these limits may need to be reduced by up to 50%.

| **Allowable vibration (in terms of peak particle velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of** | | |
|---|---|---|
| **Less than 10Hz** | **10 to 50Hz** | **50 to 100Hz (and above)** |
| 3 mm/s | 3 to 8 mm/s | 8 to 10 mm/s |

**Table 9.10: Allowable Vibration During Construction Phase**

Note that no noise or vibration monitoring would be required in this instance given the relative distance of the primary construction areas from the nearest noise sensitive receptors.

**Operational Phase**

**Activity Noise from the Creche**

The noise impact assessment outlined in the previous section has confirmed that a noise barrier wall and supplemental tree planting will be required for provision along the western boundary line.

The noise barrier wall shall have the following specifications:

- ✓ Provided along the full extent of the creche's western boundary with the Old Whitechurch Road residential properties
- ✓ A minimum height of 2m
- ✓ Imperforate (i.e. no holes or gaps in the wall)
- ✓ Constructed from a material having a minimum surface mass of 10 kg/$m^2$.

The supplemental tree planting shall be as densely as possible along the full extent of the creche's western boundary with the Old Whitechurch Road residential properties (inside and along the noise barrier wall).

**Car Park Activity Noise**

The noise impact assessment outlined in the previous section has demonstrated that noise mitigation measures will not be required.

**Traffic on New Internal Roads**

The noise impact assessment outlined in the previous section has demonstrated that noise mitigation measures will not be required.

**Additional Vehicular Traffic on Public Roads**

The noise impact assessment outlined in the previous section has demonstrated that the expected increase in noise levels on most of the surrounding road networks will be imperceptible and therefore negligible.

There is expected to be a 5dB increase and therefore a slight noise impact on residential dwellings located along Old Whitechurch Road (particularly to the south of the proposed development). However, noise emissions from the road are not expected to exceed NRA minimum threshold criteria for noise emissions from roadways and there are no supplemental mitigation measures that could be practicably provided in this instance.

Given these prevailing conditions, no additional mitigation measures would therefore be deemed as being required.

### 9.6.2 Residual impacts of the proposed development

**Construction Phase**

The application of the practicable noise control measures detailed in Section 9.6.1 and controlled hours of working should ensure that the impact of construction noise and vibration is mostly within the criteria limits established in this report and is minimised as far as practicable.

There are likely to be slight exceedances of the criteria by 1 - 2dB(A) at the nearest Old Whitechurch Road dwellings but these exceedances would be considered slight and will be very in nature

**Operational Phase**

The application of the practicable noise control measures detailed in Section 9.6.1 should ensure that the impact of operational noise and vibration is within the criteria limits established in this report and is minimised as far as practicable.

Noise emissions from additional traffic along Old Whitechurch Road due to the proposed development will result in a 5dB increase at the residential dwellings located along Old Whitechurch Road (particularly to the south of the proposed development). However, noise emissions from the road are not expected to exceed NRA minimum threshold criteria for noise emissions from roadways.

Noise emissions from the creche will also alter the current characteristic of the ambient noise environment in the vicinity of a few residential dwellings located along Old Whitechurch Road but noise emissions are predicted to be within criteria and consistent with or below the existing noise levels at the nearest noise sensitive locations so the likely amount of noise transmission to these dwellings would therefore not be considered significant.

## 9.7 Difficulties in compiling information

There were no particular difficulties encountered in relation to the production of this chapter.

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## 10.0 BIODIVERSITY

**Content** **Page**



**Figures, Plates and Tables**

## 10.1 Introduction

### 10.1.1 Chapter Author

This biodiversity chapter has been prepared by Mr. Pat Doherty MSc, MCIEEM, of DEC Ltd. Mr. Doherty is a consultant ecologist with over 20 years' experience in completing ecological impact assessment and contributing to Environmental Impact Assessment. He has been involved in the completion of assessments of multiple wind farm developments in both the Republic of Ireland and Northern Ireland where he has completed detailed habitat and fauna surveys to inform the assessment process. He has completed focused certified professional development training in a range of ecological survey techniques and assessment processes. Training has been completed for National Vegetation Classification (NVC) and Irish Vegetation Classification (IVC) surveying, bryophyte survey for habitat assessment and identification, professional bat survey and assessment training, mammal surveying and specific training for bird surveys for wind farm developments. Training has been completed by approved training providers such as CIEEM, British Trust for Ornithology and the Field Studies Council.

### 10.1.2 Chapter Context

This Chapter presents the potential impacts of the proposed development with regard to biodiversity. Desktop studies and a variety of site field surveys were undertaken to establish the baseline biodiversity within the study area and assess potential impacts of the proposed development on flora and fauna receptors occurring within the vicinity of the site.

This chapter assesses the potential impacts of the proposed residential development on the biodiversity of the site. This assessment has been undertaken by Doherty Environmental Consultants (DEC) Ltd. on behalf of The Applicant, Cork County GAA Board, and examines the potential ecological impacts of a proposed development. The purpose of this assessment is to:

- identify the habitats of the site;
- identify the existing fauna of the site;
- identify the potential impact of the proposed development;
- recommend measures to mitigate probable impacts; and
- identify any residual impacts to the site's ecology.

### 10.1.3 Methodology

**Guidance**

The scope of the following assessment follows the guidance outlined in the *CIEEM's* Guidelines for Ecological Impact Assessment (2018); TII Guidelines for Ecological Assessment of National Road Schemes; and the EPA guidance document Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022).

**Site Investigation**

DEC Ltd. was commissioned in August 2020 to undertake an Ecological Impact Assessment of the proposed Kilbarry SHD project. A desktop survey was undertaken to gather existing baseline information for the project site and surrounding area.

A range of on-site field surveys were completed to inform the baseline biodiversity conditions at and surrounding the project site.

Habitat and vegetation surveys were undertaken by DEC Ltd. during September 2020; October and November 2021; and on a monthly basis between April and July 2022.

Surveys for the presence of non-volant mammals, with particular attention given to the presence of badgers within and in the immediate vicinity of the proposed development footprint and otters along the Glenamought River to the north of the proposed development footprint and bounding the available landholding.

Breeding bird surveys were completed by DEC during the 2022 breeding bird season between April and July. Non-breeding season bird surveys were completed during the 2020 non-breeding bird season in September 2020 and during the 2021 and 2022 non-breeding bird season in October and November 2021. Detailed bat surveys were undertaken during the 2022 bat activity season.

Detailed marsh fritillary surveys were undertaken during the autumn season of 2020 in September, 2020 and during the late spring and early summer season of 2022 during May and June 2022.

**Desk Study Methodology**

A desktop assessment was carried out to collate available information on the ecological baseline of the proposed land-holding and surrounding area. Consultation was undertaken with site management as well as relevant statutory and non-statutory agencies. In addition to the above the following research was also undertaken:

- A review of the Cork County Council and the An Bord Pleanála planning files using myplan/.ie for previously published and available Environmental Impact Statements (EISs)/ Environmental Impact Assessment Reports (EIARs)/Ecological Impact Assessment Reports prepared for previous planning applications in the surrounding area. Where such reports were identified baseline ecology information was reviewed to identify any sensitive biodiversity receptors previously identified as occurring in the surrounding area.

- A review of the National Biodiversity Database to collate records of previously observed rare, threatened, or protected species within close proximity to the proposed site. Search for records held by the National Biodiversity Data Centre (NBDC) website for the four tetrads W6775 (within which the majority of the proposed development footprint and landholding are located); W6774 (within which the southern boundary of the proposed development footprint and landholding are located); W6674 (to the west of the proposed development); and W6675 (to the northwest of the proposed development) was completed.;

- A review of the NPWS online database to identify the presence or otherwise of designated conservation areas (i.e., SPAs, SACs, NHAs etc.);

- A review of Site-specific Conservation Objectives (SSCO) mapping, published by the NPWS, for SACs and SPA.

- A review of the NPWS (NPWS, 2019) Article 17 Report was completed to gathering information for the current range and distribution of species protected under the EU Habitats Directive with respect to the project site;

- A review of the online BCI Batlas;

- A review of the bat landscape classification was also completed. A landscape conservation guide for Irish bat species was published in 2011 (Lundy et al., 2011). This study identified core areas of favourable habitat for bat species in Ireland. The publication was reviewed to identify the species whose core area overlap with the proposed wind farm site.

- A review of the New Atlas of the British and Irish Flora (Preston et al., 2002)

- A review of the New Atlas of Breeding Birds in Britain and Ireland: 2007 – 2011 (Balmer et al, 2012).

- Review of aerial photography, satellite imagery and historical mapping for the proposed site.

**Field Survey Methods**

***Habitat Surveys***

Habitat surveys were carried out in during 15th and 25th September 2020; 10th October and 5th November 2021; and on a monthly basis between April and July 2022 on the following dates 29th April; 6th May; 2nd June; 21st June; and 24th June. These surveys were completed to identify, describe, map and evaluate habitats and to verify information gathered at the desk study stage. The basis of the Habitat Survey was an Extended Phase 1 Habitat Survey. The habitat survey was undertaken in accordance with the Heritage Council's Draft Best Practice Guidance for Habitat Survey and Mapping. Habitats were classified using Fossit's Guide to Habitats in Ireland (2000) which classifies habitats according to a hierarchical framework with Level 1 habitats representing broad habitat groups, Level 2 representing habitat sub-groups and Level 3 representing individual habitats. The field survey focused on identifying Level 3 habitats.

In this report, scientific and common names for higher plants follow those in the Botanical Society of the British Isles (BSBI) standard list, published on its website www.bsbi.org.uk. Scientific and common names for bryophytes follow Smith (2004). Scientific and common names of mammals follow Whilde (1993).

***Bird Surveys***

Habitat suitability for breeding birds was assessed during the multidisciplinary site survey of the proposed development site during surveys in September 2020 and October and November 2021. Following this, five dedicated breeding bird surveys were undertaken within the proposed development site and landholding to the north of the proposed development footprint on 29th April, 6th May; 2nd June; 21st June and 24th

June 2022 by Mr Pat Doherty of DEC Ltd. the methodology followed an adapted version of the Breeding Bird Survey (BBS) methodology as detailed in Gilbert et al. (1998). Transects were undertaken which covered the site and a representation of each habitat type within the lands. These included transects along existing linear habitats, such as hedgerow/treelines and scrub forming boundaries within the site; and within open grassland habitat. Parallel line transects were completed within open grassland habitats. These transects were completed to identify the presence of ground nesting birds such as meadow pipit and skylark.

All bird species seen or heard within the site (including those flying overhead) were recorded and their location and activity noted onto suitably scaled maps.

The British Trust for Ornithology's Breeding Bird Status Code was used to identify the presence of non-breeding; possible; probable and confirmed breeding for all bird species of medium (Amber-listed) and high (Red-Listed) conservation concern. The field signs used to assign the BTO breeding status code are summarised as follows:

- Non-breeding behaviour includes a bird recorded flying over; a species observed but suspected to be still on migration; a species observed but suspected to be a summering non-breeder.
- Possible breeding behaviour include a species observed during the breeding season in suitable nesting habitat or a singing male present in suitable breeding habitat.
- Probably breeding behaviour such as a pair observed in suitable nesting habitat; a permanent territory presumed through registration of territorial behaviour on at least two different days a week or more part at the same place or many individuals on one day; a courtship and display; agitated behaviour; or nest building was not observed during the breeding bird surveys.
- Confirmed breeding behaviour such as distraction-display; a used nest; recently fledged young; adults entering or leaving a nest-site; adults carrying a faecal sac or food; a nest containing eggs; or a nest with young seen or heard, was not observed during the breeding bird survey.

***Bat Surveys***

An appraisal of habitats occurring within the project site for their potential to support bat species was completed during the field surveys in September 2020. These appraisals involved the inspection of structures on site during the daytime for field signs indicating the presence of bats, and the potential for mature trees occurring within the project site to function as bat tree roosts.

The daytime inspections of structures were completed during surveys in September 2020 and again during surveys in May and June 2022. All buildings within the project site are to be demolished. The roost potential of structures was assessed with reference to features that are typically associated with bat roosts in buildings. Kelleher and Marnell (2022) and Hundt (2012) outlined a series of factors associated with buildings that are more or less likely to support bat roosts. These factors are provided in Table 10.1 below.

| | |
|---|---|
| **Increase Potential** | Disused or little used; largely undisturbed |
| | Large roof void with unobstructed flying spaces |
| | Large dimension roof timbers with cracks, joint and holes |
| | Uneven roof covering with gaps, though not too draughty and cool |
| | Entrances that bats can fly in through |
| | Hanging tiles or wood cladding, especially on south-facing walls |
| | Rural setting |
| | Close to woodland and/or water |
| | Pre-20th century or early 20th century construction |
| | Roof warmed by the sun |
| **Decrease Potential** | Urban setting or highly urbanised area with few feeding places |
| | Small or cluttered roof void |
| | Heavily disturbed |
| | Modern construction with few gaps around soffits or eaves |
| | Prefabricated with steel sheet materials |
| | Active industrial premises |
| | Cool, shaded, light or draughty roof voids |

**Table 10.1: Factors affecting the potential of buildings to support bat roosts**

Dedicated bat activity surveys were completed on site. This involved roost emergence surveys at structures on site during the June 2022 survey dates as well as continuous static detector monitoring at the project site over an 18 night period between the 2nd June and 20th June 2022. Three Song Meter Mini Full Spectrum bat detectors were deployed on site to monitoring bat activity. The static bat detectors were positioned within structured vegetation in the form of an existing hedgerow/treeline, now expanded into scrub along the northern boundary of the proposed development footprint; within open recolonising grassland mosaic habitat that is now being encroached by willow scrub towards the east of the project site; and adjacent to structured vegetation alongside the southern boundary of the project site. Figure 10.1 shows the location of the static bat detector locations (as well as the location taken up during the roost emergence surveys). The static detectors were mounted at a height of 4m above the ground and were set to recorded bat activity continuously throughout each night, with recording commencing at 30 minutes prior to sunset and 30 minutes after sunrise. A total of 19 nights of continuous bat monitoring in the vicinity of the static bat detector locations MP1 and MP2and a total of 15 nights at MP3 was completed on site.


**Residential Development Cork County GAA Board Lands**

**Figure 10.1**

**Bat Monitoring Locations**

**Monitoring Point (MP) No.**

- MP1
- MP2
- MP3
- Landholding
- Development Footprint

0 0.0225 0.045 0.09 Km

N W E S

| | |
|---|---|
| Drawn By | PD |
| Date | 24/06/2022 |
| Data Source | Bing |

Bat calls recorded by the SM4 Bat detectors during the automatic bat monitoring sessions were analysed using Kaleidoscope Pro (v. 5.1.9i) software. Kaleidoscope automatic bat identification software was used to assign bat calls to species level. Bat calls assigned to Myotis species were grouped together under the Myotis genus.

***Non-volant Mammal Surveys***

A survey for field signs indicating the presence of otters or other protected non-volant mammal species such as Irish stoat and badgers was undertaken during the field surveys. This survey was undertaken during the daytime and particular attention was given to habitat features normally associated with otters. Any mammal field signs typical of otter activity were recorded during the surveys. These field signs, as described in Neal & Cheeseman (1) and Bang & Dahlstrom (2), include:

- mammal breeding and resting places, such as setts, holts, couches, lairs;
- pathways;
- prints;
- spraints and faecal deposits;
- latrines (and dung pits used as territorial markers);
- prey remains and feeding signs (snuffle holes);
- hair; and
- scratch marks.

***Marsh Fritillary Surveys***

***Succisa pratensis/Larvae Web Survey***

Surveys were undertaken during September 2020 to record the presence or otherwise of larvae webs on stands of *Succisa pratensis*. The 2020 larvae web survey was completed on the 15th and 25th September 2020. These surveys involved identifying dense patches of *Succisa pratensis* within the landholding in which the proposed development is located and searching the lower leaves of the plants for the presence of marsh fritillary larvae webs.

The quality of the habitat within the landholding to support marsh fritillary colonies was also assessed during this survey and also during subsequent surveys during the summer of 2022. The findings of the habitat quality surveys detailed in this Chapter are based upon the results of the current habitat conditions during the summer (June/July) of 2022. Habitat quality is defined according to Fowles (2005). Under this system habitats are categorised according to a hierarchy based upon the condition of patches to support breeding colonies. This hierarchy ranges from Good Condition Habitat to Unsuitable Habitat. Definitions for each of the six categories within this hierarchy are taken from Fowles (2005) and are as follows:

(1) Neal, E., & Cheeseman, C., (1996). 'Badgers'. Poyser Natural History, London.

(2) Bang, P., & Dahlstrom, P., 'Animal Tracks and Signs'. Oxford University Press, Oxford.

*Good Condition Habitat (GC)*

Grassland where, for at least 80% of sampling points, the vegetation height is within the range of 12-25cms and *Succisa pratensis* is present within a 1 m radius. Scrub (>0.5 metres tall) covers no more than 5% of area. Habitat patches in this condition will constitute the most important breeding areas for marsh fritillaries within the landscape, even though higher larval web densities may sometimes occur in slightly ranker conditions, as maintenance of appropriate grazing levels (0.3-0.4 livestock units by cattle or ponies) will sustain vegetation structure in the long term.

*Suitable (Under-grazed) Habitat (SU)*

Grassland where *Succisa pratensis* is occasional/frequent/abundant and vegetation height is above 25cm, or in which sward height is between 12-25cm but scrub (>0.5m tall) covers more than 5% of area. Such habitat is capable of supporting marsh fritillaries in its current condition but its significance will decline over a 5-10 year period unless action is taken. Restoration of appropriate grazing levels (perhaps requiring initial management in the form of mowing or patch burning before the introduction of stock) should improve habitat quality to Good Condition.

*Suitable (Over-grazed) Habitat (SO)*

Grassland with frequent-abundant *Succisa* but which is currently over-grazed such that the sward is below 12cm on average. Mown swards may also come under this category. Such habitat is not capable of supporting marsh fritillaries in its current condition, although short- sward rosettes may be utilised by larvae where these are adjacent to breeding habitat. Reductions in stocking density to approximately 0.3-0.4 livestock units (or cessation of mowing) should improve vegetation structure towards Good Condition in the short term.

*Suitable (Sparse) Habitat (SS)*

Grassland with sparse (rare-occasional) *Succisa* and vegetation height less than 25cm on average. Superficially these patches may have good vegetation structure but the paucity of *Succisa* means that they are less favoured by marsh fritillaries. Edaphic conditions may dictate the abundance of *Succisa* but this may also be due to past or current management practices, such as frequent mowing in the absence of grazing animals. If this is the case then re-introduction of grazing stock may break up the sward sufficiently to allow germination of any *Succisa* within the seed bank and Good Condition habitat may return in the near future. *Succisa* may also be rare in the sward due to a history of sheep grazing and in such instances removal of sheep may allow condition to improve quickly.

*Potential (Rank) Habitat (PR)*

Grassland with rare *Succisa* but which is currently under-grazed or neglected such that the sward is above 25cm on average and *Succisa* occurs as scattered plants, usually in a rank, tussocky sward. Management of such grasslands will require considerable effort (in the form of mowing, patch burning and probably scrub control) before grazing can be introduced at appropriate levels. Where landscapes are regarded as containing insufficient habitat to guarantee long-term viability of the marsh fritillary metapopulation, Potential (Rank) patches will offer the best option for habitat restoration, but they are unlikely to support anything more than the occasional larval web without management.

*Unsuitable Habitat (NS)*

All other habitat types are mapped under this category. This will include patch types that potentially could be restored to support marsh fritillaries, but this is likely to involve a considerable resource input to correct former agricultural practices or to alter soil hydrology.

**Biodiversity Receptor Evaluation**

***Habitats***

Commentary on the ecological value of habitats is provided in Section 4 of this report.

The nature conservation value of habitats and ecological sites occurring within the proposed site are based upon an established geographic hierarchy of importance as outlined by the National Roads Authorities (NRA, 2009). The outline of this geographic hierarchy is provided below and this has been used to determine ecological value in line with the ecological valuation examples provided by the NRA (see NRA, 2009). The geographic evaluation hierarchy is as follows:

- International Sites (Rating A);
- National Importance (Rating B);
- County Importance (Rating C);
- Local Importance (higher value) (Rating D); and
- Local Importance (lower value) (Rating E)

***Birds***

The bird assemblage recorded at the proposed development site is valued with regard to the ecological valuation examples set out in *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 211*

The evaluation of the avifauna recorded at the project site during the baseline surveys is also informed by the approach detailed by Percival (2003). This approach defines the sensitivity of a species and bird assemblage as the ecological importance and nature conservation interest at the site being assessed. The ecological importance and nature conservation interest is determined by a number of factors including:

- whether the species is on Annex 1 of the EC Birds Directive;
- whether the area being assessed is subject to any nature conservation designations;
- whether the species is particularly ecologically sensitive: this includes larger birds of prey and rare breeding birds (including divers, common scoter, hen harrier, golden eagle, red-necked phalarope, roseate tern and chough);
- whether the site contains species at nationally important numbers (>1% of Irish population);
- whether the site contains species at regionally important numbers (>1% of regional population, with the region usually taken as the county); and
- whether the species is subject to special conservation measures, eg as red or amber species on the BirdWatch Ireland's (Newton et al. 1999) list of Birds of Conservation Concern.

The determination of sensitivity is summarised, as per Percival (2003), in Table 10.2 below.

| Sensitivity | Determining Factor |
|---|---|
| Very High | Species listed as qualifying interests for SPAs and other statutorily protected nature conservation areas. |
| High | Species that contribute to the integrity of an SPA but which are not listed as qualifying interests for which the site is designated.<br>Ecologically sensitive species including the following:<br>Red Grouse; hen harrier; and golden eagle.<br>Species present in nationally important numbers (>1% Irish population). |
| Medium | Species on Annex 1 of the EC Birds Directive<br>Species present in regionally important numbers (>1% regional (county) population)<br>Other species on BirdWatch Ireland's red list of Birds of Conservation Concern |
| Low | Any other species of conservation interest, including species of BirdWatch Ireland's amber list of Birds of Conservation Concern not cover above. |

**Table 10.2: Criteria for Ranking Bird Sensitivity**

***Bats***

The approach outlined by Kepel (2011) to quantifying bat activity has been used to evaluate the level of bat activity recorded at and surrounding the proposed development site and the importance of the proposed development site and surrounding area as a foraging resource for bats.

The Kepel approach is based on assigning the number of bat passes recorded per hour per night of each monitoring session to an activity category. Kepel has assigned the number of passes per hour to three activity categories. These activity categories are as follows:

- Pipistrelle species and Leisler's bat: Low = <3.5 passes per hour; Moderate = 3.6 – 6.5 passes per hour; High = >6.5 passes per hour.
- All Other Bat species: Low = <4.0 passes per hour; 4.1 to 10 passes per hour; high = >10 passes per hour.

The median bat pass per hour per night for each species recorded during bat activity surveys has been used to assign bat activity levels in line with the Kepel approach. Median bat pass per hour per night is used during this analysis as it is recognised as providing a more accurate representation of activity, as bat activity levels between nights can be highly variable and thus the median provides a more reliable value that the mean or maximum (Lintott & Matthews, 2018).

***Non-Volant Mammals***

The nature conservation value of non-volant mammal populations recorded during field surveys has been assigned in accordance with the criteria set out by the TII 2009 guidance document.

***Marsh fritillary***

The nature conservation value of marsh fritillary populations recorded during field surveys has been assigned in accordance with the criteria set out by the TII 2009 guidance document.

### 10.1.4 Assessment methodology

***Impact Magnitude***

Impact magnitude refers to changes in the extent and integrity of an ecological receptor. The TII/NRA Guidelines for Ecological Impact Assessment (2009) defines integrity of designated conservation areas as "*the coherence of the ecological structure and function across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued*". For non-designated sites this can be amended to: "*the coherence of ecological structure and function, that enables it (the site or population's supported by the site) to be maintained in its present condition*".

For the purposes of this assessment, the impact magnitude is influenced by the intensity, duration, frequency and reversibility of a potential impact and is categorised as follows:

- High magnitude impact: that which results in harmful effects to the conservation status of a site, habitat or species and is likely to threaten the long-term integrity of the system.
- Moderate magnitude impact: that which results in harmful effects to the conservation status of a site, habitat or species, but does not have an adverse impact on the integrity of the system.
- Low magnitude impact: that which has a noticeable effect but is either sufficiently small or of short duration to cause no harm to the conservation status of the site, habitat or species.
- Imperceptible: that which has no perceptible impact.
- Positive: that which has a net positive impact for the conservation status of a site, habitat or species.

The assessment of impact magnitude for birds follows Percival (2003).

***Impact Significance***

The significance of impacts is determined by evaluating the nature conservation value of the site, habitat or species concerned together with the magnitude of the impacts affecting the system. The more ecologically valuable a receptor and the greater the magnitude of the impact, the higher the significance of that impact is likely to be. Table 10.*3* outlines the levels of impact significance to be used during the assessment of impacts. The probability of an impact occurring will also be outlined when defining the significance of impacts.

The assessment of impact significance for birds follows the approach set out by Percival (2003).

| Nature Conservation Value | Magnitude of Potential Impact | | | |
|---|---|---|---|---|
| | High | Moderate | Low | Imperceptible |
| International | Severe | Major | Moderate | Minor |
| National | Severe | Major | Moderate | Minor |
| County | Major | Moderate | Minor | Minor |
| Local (High) | Moderate | Minor | Minor | Negligible |
| Local (Low) | Minor | Negligible | Negligible | Negligible |

**Table 10.3: Impact Significance Criteria**

## 10.2 Description of Baseline/ Existing Environment

### 10.2.1 Site Overview

The lands comprising the project site can be separated into two distinct sections, the relatively flat areas to the south and the areas which slope steeply down to the River Bride valley along the northern portion of the lands. There is a derelict building located to the Northwest corner of the site which was previously used as a Hurley making premises. Along the Old Whitechurch Road the lands fall steeply down to the road and there are high tension ESB cables and pylons which are located in the northeast corner of the site.

The land cover (as per Fossitt, 2000) at and surrounding the project site is dominated by neutral grassland and made ground within the developable area. Scrub occurs to the west of the developable area along with corrugated buildings. In the open space to the north of the developable area the ground slopes steeply to the north and a mix of unimproved grassland and established scrub and broadleaved woodland occur along the slopes. The grassland on the steep north facing slopes supports abundant Succisa pratensis and is known to support a population of marsh fritillary, a species listed on Annex 2 of the EU Habitats Directive.

The River Bride forms the northern boundary of the project site. The River Bride is located within the River Lee surface water catchment and the Kiln_SC_010 sub-catchment. The water quality of the section of the River Bride to the north of the project site is currently under review and has not been assigned by the EPA. The section of the River Bride a short distance downstream, beyond Glenamought Bridge has been assessed by the EPA and has been classified as an "At Risk" waterbody under the Water Framework Directive (Water Framework Directive). The remainder of the River Bride downstream to its confluence with the River Lee has been classified as "At Risk". Nutrients in the form of ortho-phosphates in particular have been identified as having a negative impact on the water quality of the River Bride downstream.

Site investigations have been completed at the project site. No groundwater was encountered during the investigation works. Some made ground was discovered to the east of the site, up to 4m in depth. In addition some shallow bedrock was discovered on the west of the site between 0.6m and 2.3m in depth. The made ground area comprises fill that was illegally dumped by others in 1999 without the knowledge or permission of Cork County GAA Board. The filled areas has been sampled and tested and the material

therein has been confirmed as being non-hazardous and benign. Given that this material has been in place for over 20 years it is intended to leave this material in place.

Land use activities within the landholding includes recently ceased livestock grazing. Horses grazed the landholding until this ceased in circa 2020. The landholding is now regularly used as a recreational walking and dog walking area, with walkers being observed during all site survey days.

### 10.2.2 Designated Conservation Areas

The proposed development and the landholding in which the proposed development is located are not located within or subject to any statutory nature conservation designations.

The nearest European Site to the project site is Cork Harbour SPA, located approximately 5km to the east, overland from this project site. The nearest SAC to the project site is the Great Island Channel SAC, located approximately 10.5km to the southeast of the project site.

There are no Natural Heritage Areas (NHAs) occurring in the wider area surrounding the project site. The nearest proposed NHAs (pNHAs) to the project site is the Blarney Bog pNHA, located approximately 3.5km to the west of the project site. The Cork Harbour SPA to the east and southeast of the project site is also listed as a pNHA.

The project site is located within the River Bride sub-catchment (EPA name: Kiln_SC_010) of the River Lee catchment and will result in the discharge of attenuated surface water from the proposed development to this sub-catchment. The River Bride drains to the lower River Lee, which in turn drains to the River Lee Estuary, along which a section of the Cork Harbour SPA and pNHA is located. As such there is a hydrological pathway connecting the project site to the River Lee Estuary and the section of the SPA and pNHA occurring at this location. No other designated conservation areas are connected to the project site via other pathways.

### 10.2.3 Rare, Threatened or Protected Species

A search of the National Biodiversity Data Centre (NBDC) for records of rare and/or threatened species previously identified within and in the vicinity of the project site was completed in June 2022. Information for the four 1km$^2$ grids W6775 (within which the majority of the proposed development footprint and landholding are located); W6774 (within which the southern boundary of the proposed development footprint and landholding are located); W6674 (to the west of the proposed development); and W6675 (to the northwest of the proposed development) was downloaded from the NBDC website.

The rare, threatened and protected species identified as occurring within these 1km grid squares are listed in Table 10.4 below and a comment on the project site's potential to support these species is also provided. It is noted that the majority of bird species in Ireland are afforded protection under the Wildlife Acts as amended. However only those species that have been identified as rare, threatened (i.e. Amber or Red listed species on the Birds of Conservation Concern in Ireland) and protected under EU legislation are listed in Table 10.4 below.

| Species Group | Species name | Date of last record | Designation | Potential for the proposed development footprint to support the species |
|---|---|---|---|---|
| amphibian | Common Frog (Rana temporaria) | 13/02/2017 | Protected Species: Wildlife Acts | No. No suitable habitat in the form of permanent surface water features occur for this species within the proposed development footprint. |
| bird | Barn Swallow (Hirundo rustica) | 30/05/2020 | Protected Species: Wildlife Acts; Threatened Species: Birds of Conservation Concern - Amber List | This species has been observed foraging within the proposed development footprint. Derelict barns within the site have the potential to support breeding swallow. The proposed development footprint provides suitable foraging habitat for this species. |
| bird | Common Kestrel (Falco tinnunculus) | 30/05/2020 | Protected Species: Wildlife Acts; Threatened Species: Birds of Conservation Concern - Amber List | The proposed development footprint provides suitable habitat for this species. |
| bird | Common Snipe (Gallinago gallinago) | 02/02/2016 | Protected Species: Wildlife Acts; Threatened Species: Birds of Conservation Concern - Amber List | This species relies on wetland habitats and poorly drained ground for roosting and breeding. No suitable habitat occurs within the proposed development footprint. |
| bird | Common Swift (Apus apus) | 14/06/2016 | Protected Species: Wildlife Acts; Threatened Species: Birds of Conservation Concern - Amber List | The derelict barns within the proposed development footprint offer suboptimal breeding habitat for this species. The habitats occurring within the proposed development footprint provide suitable foraging habitat for this species. |
| bird | Eurasian Woodcock (Scolopax rusticola) | 24/11/2016 | Protected Species: Wildlife Acts; Threatened Species: Birds of Conservation Concern - Amber List | This species relies on wetland habitats and poorly drained ground for roosting and breeding. No suitable habitat occurs within the proposed development footprint. |

| | | | | |
|---|---|---|---|---|
| bird | House Martin (Delichon urbicum) | 14/06/2016 | Protected Species: Wildlife Acts; Threatened Species: Birds of Conservation Concern - Amber List | This species has been observed foraging within the proposed development footprint. The derelict barns within the proposed development footprint offer suboptimal breeding habitat for this species. The habitats occurring within the proposed development footprint provide suitable foraging habitat for this species. |
| bird | Yellowhammer (Emberiza citrinella) | 25/06/2020 | Protected Species: Wildlife Acts; Threatened Species: Birds of Conservation Concern - Red List | A singing male has been recorded at the southeast corner of the proposed development footprint during field surveys. The treeline/hedgerow boundaries and scrub provide suitable nesting habitat for this species. This species relies upon seeds for food and principally cereal grain. Grassland habitats within the proposed development footprint provide a small area of suitable habitat for this species. |
| flowering plant | Round-leaved Crane's-bill (Geranium rotundifolium) | 23/04/2019 | Threatened Species: Endangered | This species is associated with calcareous soils, which do not occur at the project site. Can also be associated with waste ground. This species has not been recorded within the proposed development footprint. |
| insect - butterfly | Marsh Fritillary (Euphydryas aurinia) | 23/04/2019 | Protected Species: EU Habitats Directive Annex II Threatened Species: Vulnerable | Associated with grassland habitat supporting stands of Succisa pratensis. Such habitat does not occur within the proposed development footprint. Suitable and known habitat for this species occurring immediately to the north of the proposed development footprint. |
| insect - hymenopteran | Large Red Tailed Bumble Bee (Bombus | 25/02/2019 | Threatened Species: Near threatened | This species has been observed along the northern |

| | | | | |
|---|---|---|---|---|
| | (Melanobombus) lapidarius) | | | hedgerow/treeline boundary of the proposed development footprint. Suitable habitat occurs within the proposed development footprint and to the north of the proposed development footprint. |
| terrestrial mammal | Eurasian Badger (Meles meles) | 09/08/2017 | Protected Species: Wildlife Acts | This species has not been recorded within the proposed development footprint or adjacent areas. Suitable foraging habitat occurs within the proposed development footprint for this species. Areas of thin soil cover that occur throughout the proposed development footprint limit the suitability to support badger setts. |
| terrestrial mammal | European Otter (Lutra lutra) | 18/07/2016 | Protected Species: EU Habitats Directive Annex II Protected Species: Wildlife Acts | No suitable habitat for this species occurs within the proposed development footprint. This species is known to occur along the Glenamought River to the north of the proposed development footprint. |
| terrestrial mammal | West European Hedgehog (Erinaceus europaeus) | 15/09/2017 | Protected Species: Wildlife Acts | Suitable habitat in the form of scrub and hedgerow/treeline boundaries occur within the proposed development footprint. |

**Table 10.4: Records of rare, threatened, or protected species & potential for proposed development footprint to support these species**

### 10.2.4 Habitats

The habitats occurring within the landholding in which the proposed development is located have been identified to Level 3 of the Guide to Habitats in Ireland (2000). Figure 10.2 provides a habitat map showing the location and extent of habitats occurring within the landholding. The following sub-sections describe each of the habitats occurring within the landholding.

***Semi-Improved Grassland GA1/GS3***

The semi-improved grassland habitat is representative of species-poor grassland, formerly used for livestock grazing that is now subject to relaxed management. The sward in this grassland habitat has been un-managed for the 2021 and 2022 growing seasons allowing the vegetation to develop into a tall sward

dominated by grasses. The species occurring within this habitat include Arrhenatherum elatius, Avena fatua, Poa trivalis, Poa pratensis, Cynosaurus cristatus, Holcus lanatus, Festuca rubra, Agrostis stolonifera, Lolium perenne, Conopodium majus, Stellaria graminea, Cerastium fontanum, Ranunculus repens, Trifolium repens, Veronica chamaedrys, Plantago lanceolata, Rumex acetosa, Senecio jacobaea, Luzula multiflora and Medicago lupulina.

**Nature Conservation Value**

The semi-improved grassland habitat within the footprint of the project site consists of a restricted range of species and is considered to be species-poor. It is of low heritage value, representative of a habitat of low importance (lower value, Rating E).

***Dry Acid Grassland GS3***

The dry acid grassland habitat occurs to the north of the proposed development footprint within the overall site landholding. It occurs on more steeply sloping ground and is likely to have been subject to lower levels of livestock grazing in the past. The sward is lower and more diverse and is not dominated by tall or tussocky grass species. This grassland is more diverse in terms of the herb species occurring. The sward in this habitat consists of Rumex acetosa, rum crispus`, Hyacinthoides non-scripta, Plantago lanceolata, Potentilla erecta, Conopodium majus, Stellaria graminea, Luzula multiflora, Pedicularis sylvatica, Lotus corniculatus, Trifolium repens, Lolium perenne, Dactylus glomerata, Poa pratensis, Poa trivalis, Knautia arvensis, Succisa pratensis, Taraxacum officinalis agg., Potentilla anserina, Cirsium arvense, Bellis perennis, Carex nigra and Carex remota. Succisa pratensis, the food plant of the marsh fritillary butterfly larvae is particularly abundant towards the western end of this habitat.

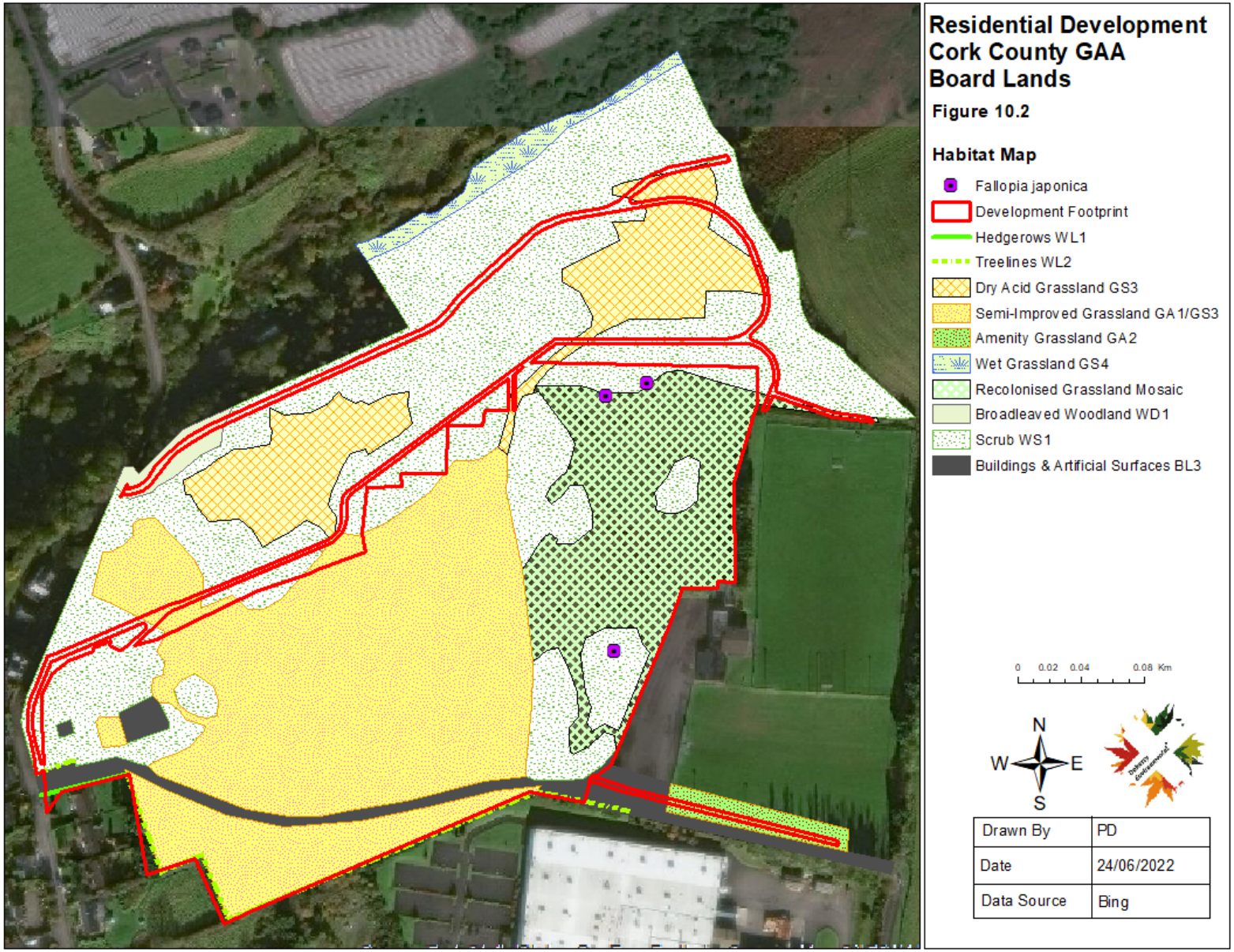
**Nature Conservation Value**

The example of dry acidic grassland with abundant Succisa pratensis to the north of the proposed development footprint is known to support a population of marsh fritillary, a species listed on Annex II of the EU Habitats Directive. Given the reliance of this species on this area of dry acidic grassland it is considered to be of county importance (Rating C). The remainder of the dry acidic grassland, which Succisa pratensis is absent to rare is representative of a semi-natural grassland habitat that is representative of a habitat of high importance (higher value, Rating D).

***Recolonised Grassland Mosaic ED3***

This area of the site has been subject to disturbance in the past with the vegetation being denuded. The 2000 aerial imagery for the project site indicates the presence of bare ground in this area of the site. The 2005 imagery indicates that this area had become recolonised by vegetation and the intervening imagery between 2005 and present day suggests that this area has been under continuous vegetation cover since becoming recolonised after clearance in 2000. The vegetation occurring within this area is a mix of species with patchy dominance of dominated species and the presence of a range of species that are generally indicative of waste ground/recolonising bare ground habitat. In places Juncus effusus is dominated and this gives way to areas of very thin soil cover being dominated by Tripleurospermum inodoratum. Salix aurita is spreading in areas of this habitat. Other species occurring include Poa pratensis, Poa trivalis, Cynosaurus cristatus, Alopecurus pratensis, Dactylus glomerata, Holcus lanatus, Medicago lupulina, Ranunculus repens, Ranunculus flammula, Bellis perennis, Trifolium pratense, Trifolium repens, Potentilla anserina, Carex nigra, Carex otrubae, Stellaria graminea, Prunella vulgaris, Rumex crispus, Rubus fruticosus

agg. , Chamerion angustifolium, Centaurea nigra, Dipsacus fullonum, Knautia arvensis, Sonchus oleraceus, Lapsana communis, Senecio jacobaea, Lotus corniculatus, Vicia cracca, Plantago lanceolata, Cirsium arvense, Cirsium vulgare and Buddleja davidii.


Residential Development
Cork County GAA
Board Lands
Figure 10.2
Habitat Map
Fallopia japonica
Development Footprint
Hedgerows WL1
Treelines WL2
Dry Acid Grassland GS3
Semi-Improved Grassland GA1/GS3
Amenity Grassland GA2
Wet Grassland GS4
Recolonised Grassland Mosaic
Broadleaved Woodland WD1
Scrub WS1
Buildings & Artificial Surfaces BL3
0 0.02 0.04 0.08 Km
N
W
E
S
Drawn By PD
Date 24/06/2022
Data Source Bing

**Nature Conservation Value**

The recolonised grassland mosaic habitat within the footprint of the project site consists of a restricted range of species and is considered to be species-poor. It is of low heritage value, representative of a habitat of low importance (lower value, Rating E).

***Scrub WS1***

The scrub habitat occurring within the proposed development footprint and surrounding landholding is dominated by dense stands of Prunus spinosa and Ulex europeaus. Prunus spinosa is the dominant species within patches of scrub occurring within the proposed development footprint. Salix aurita is also spreading on previously cleared ground to the east of the proposed development footprint. Patches of Rubus fruticosus agg. dominated scrub occur to the west of the proposed development footprint surrounding the derelict barns and is also spreading out along hedgerow/treeline boundaries. On the sloping ground to the north both Ulex europeaus and Prunus spinosa are dominant with both species spreading. Prunus spinosa in particular has been noted spreading into area of Succisa pratensis abundant acid grassland habitat.

**Nature Conservation Value**

The scrub habitat to the north of the project site provides an area of semi-natural woodland in an area otherwise dominated by artificial and intensively managed agricultural and urban land cover. It is an example of a mature mixed broadleaved woodland and it supports a range of flora and fauna species and offers shelter and a foraging resource for fauna. The woodland is of ecological value in the wider surrounding and its of high value at the local level (Rating D).

Other bramble dominated scrub habitat occurring within the proposed development footprint is of low value at the local level (Rating E).

***Broad-leaved woodland WD1***

On the lower slopes within the landholding adjacent to its northern boundary the Prunus spinosa scrub gives way to established woodland habitat consisting of Fraxinus excelsior, Fagus sylvatica, Ilex aquifolium and Crataegus mongyna.

**Nature Conservation Value**

The woodland habitat to the north of the project site provides an area of semi-natural woodland in an area otherwise dominated by artificial and intensively managed agricultural and urban land cover. It is an example of a mature mixed broadleaved woodland and it supports a range of flora and fauna species and offers shelter and a foraging resource for fauna. The woodland is of ecological value in the wider surrounding and its of high value at the local level (Rating D).

***Hedgerow Wl1/Treeline Wl2***

Treelines and hedgerows form boundaries within the landholding. These features consist of Crataegus mongyna dominated boundaries with Fraxinus excelsior, Ilex aquifolium, Prunus spinosa and Sambuca nigra also occurring.

**Nature Conservation Value**

The hedgerows and treelines bounding the project site provide links to the woodland to the south and connectivity to the wider linear network of hedgerows and treelines in the surrounding area. These linear woodland features support a range of fauna, including foraging and commuting bat species and nesting birds. They are of high local value (Rating D).

***Eroding Watercourse FW1***

The Glenmought River flows broadly east to west along the northern boundary of the landholding in which the proposed development footprint is located. It flows through a steep V-side valley and over gradients that result in high flow rates indicative of an eroding watercourse. The section of the river along the northern boundary ranges from 2m to 3m in width. The river bed substrate consists of sand, gravel, cobbles and large boulders. Silt levels were low along this section of the river. The instream habitats are diverse and include riffle, run and glide sections along broad meanders. Some pool habitat is also present. Shading is limited to the northern side, while the absence of continuous woodland habitat along the southern bankside facilitates light penetration. The river channel and riparian corridors are unmodified and in natural condition. Habitat conditions for salmonids and spawning lamprey are considered to be good. However downstream modifications to the lower section of the River Bride, which is culverted under Blackpool upstream from its tributary of the River Lee are considered to represent impassable barriers to the upstream migration of salmonids. Nevertheless the Glenamought River is known to support moderate stocks of wild brown trout (Salmo trutta).

The water quality of the section of the Glenamought River is currently under review and has not been assigned by the EPA. The section of the River Bride a short distance downstream, beyond Glenamought Bridge has been assessed by the EPA and has been classified as an "At Risk" waterbody under the Water Framework Directive (Water Framework Directive). The remainder of the River Bride downstream to its confluence with the River Lee has been classified as "At Risk". Nutrients in the form of ortho-phosphates in particular have been identified as having a negative impact on the water quality of the River Bride downstream.

**Nature Conservation Value**

The section of the Glenamought River downstream of the project site that will receive surface water from the project site during the operation phase is representative of a freshwater habitat of county importance (Rating C) owing to the populations of brown trout and Annex II species such as river lamprey and otters that are known to rely on this habitat for spawning and breeding/foraging.

***Non-Native Invasive Species***

Three non-native invasive species have been recorded within the landholding and the proposed development footprint. These include Fallopia japonica, Buddleja davidii and Petasites fragrans. Two stands of Fallopia japonica have been recorded within the project site and their location is indicated on Figure 10.2. Buddleja davidii occurs at locations throughout the site in association with scrub habitat. It is most prevalent to the east of the proposed development footprint within the recolonised grassland mosaic habitat. Petasites fragrans is also most apparent in this area of the site.

### 10.2.5 Fauna

**Birds**

A range of bird species were seen and heard on site during the site field surveys completed between April and July 2022. Species recorded during surveys are listed on Table 10.5 below along with their breeding status, which has been assigned in accordance with the BTO categorisation of breeding status (see Section above).

| Species | BTO Breeding Status | BOCCI Status |
|---|---|---|
| Blackbird | Confirmed | Green |
| Blackcap | Probably | Green |
| Blue Tit | Probably | Green |
| Buzzard | Non-Breeding | Green |
| Chaffinch | Confirmed | Green |
| Chiffchaff | Probably | Green |
| Coal Tit | Probably | Green |
| Dunnock | Probably | Green |
| Goldfinch | Probably | Green |
| Great Tit | Probably | Green |
| Greenfinch | Confirmed | Amber (Breeding) |
| Hooded Crow | Non-Breeding | Green |
| House Sparrow | Probably | Amber (Breeding) |
| Long-Tailed Tit | Probably | Green |
| Magpie | Probably | Green |
| Pheasant | Non-Breeding | Green |
| Robin | Probably | Green |
| Rook | Non-Breeding | Green |
| Song Thrush | Probably | Green |
| Starling | Non-Breeding | Amber (Breeding) |
| Stonechat | Probably | Green |
| Swallow | Non-Breeding | Amber (Breeding) |
| Wood Pigeon | Non-Breeding | Green |
| Wren | Probably | Green |
| Yellowhammer | Possible | Red (Breeding) |

**Table 10.5: Recorded Bird Species, Breeding Status & Conservation Status**

The majority of species recorded within or flying over the landholding and the proposed development site during surveys included green listed bird of low conservation concern. However, amber and red listed birds as per the Birds of Conservation Concern in Ireland (BoCCI) list were also noted during surveys and included greenfinch, house sparrow, starling, swallow which are amber listed bird species and yellowhammer which is a red listed bird species. Greenfinch was the only amber listed species confirmed as breeding within the landholding. This species was confirmed breeding within scrub habitat to the north

of the proposed development footprint near the eastern side of the landholding. House sparrow was recorded during field surveys and was identififed as probably breeding in woodland habitat to the north of the proposed development footprint. Starling and swallow were observed on site but were considered to use the landholding and proposed development footprint for foraging and did not breed within the landholding. Yellowhammer, the only red listed breeding species observed during surveys, was recorded as a singing male at the southeast corner of the landholding and proposed development footprint and also to the north of the northeast corner of the proposed development footprint.

**Nature Conservation Value**

No bird species that are representative of high; or very high sensitivity (as classified in Table 10.5 above) were identified as relying on the proposed development site as a breeding site during bird surveys in 2022. Only one species, namely yellowhammer, of medium sensitivity (yellowhammer is red-listed and of high sensitivity) was recorded during the 2022 breeding season surveys.

In light of the above it is considered that the proposed development footprint is representative of a site of low sensitivity for birds. Nevertheless, given the presence of red-listed and amber-listed bird species at and in the vicinity of the proposed development footprint, the bird assemblage is representative of a receptor of local importance (higher value) (Rating D).

**Non-volant mammals**

No breeding or resting places of protected non-volant mammals were recorded within the proposed development footprint or the surrounding landholding. No field signs of badger or otter were observed on site during surveys for protected non-volant mammals.

Smaller mammals such as hedgehog, which have been previously recorded at the project site are likely to occur within woodland habitats. Rabbits are present throughout the landholding and the proposed development footprint and rabbit burrows were recorded in scrub and hedgerow/treeline within and bounding the proposed development footprint.

**Nature Conservation Value**

No evidence of protected mammal species was recorded during field surveys and the proposed development footprint is representative of a site of local importance (lower value) (Rating E) for non-volant mammals.

**Bats**

***Bat Habitat Classification***

A review of the national bat landscapes classification layer on Biodiversity Ireland maps by the NBDC shows that the landholding has been assigned a suitability index of 25.78 for all bat species. This is representative of a landscape of medium suitability for all bat species. The bat landscapes classification layer assigns an index rating for individual bat species as follows:

- Soprano pipistrelle: Index – 37 – indicative of high landscape suitability for Soprano pipistrelle
- Common pipistrelle: Index – 36 – indicative of medium to high landscape suitability for Common pipistrelle.
- Nathusius pipistrelle: Index – 12 – indicative of high landscape suitability for Nathusius pipistrelle.

- Brown long-eared bat: Index – 34 – indicative of medium to high landscape suitability for brown long-eared bat.
- Leisler's bat: Index – 33 – indicative of medium to high landscape suitability for Leisler's bat.
- Lesser horseshoe bats: Index – 0 – indicative of low landscape suitability for lesser horseshoe bats.
- Daubenton's bat: Index – 21 – indicative of low to medium landscape suitability for Daubenton's bat.
- Natterer's bat: Index – 32 – indicative of medium to high landscape suitability for Natterer's bat.
- Whiskered bat: Index – 27 – indicative of medium landscape suitability for Whiskered bat.

***Bat Roost Potential***

Based on the Marnell, Kelleher & Mullen (2022) roost potential assessment criteria, Table 10.6 describes the main structural features that are listed as factors influencing roost potential.

| Factor | Factors Influence on Roost Potential |
|---|---|
| Structures are derelict and draughty with voids in the window and door opes and large gaps in the roofs | Decreased Potential |
| The structures are of modern construction | Decreased Potential |
| The structures are of a prefabricated materials | Decreased Potential |
| The structures are located within an active commercial premises | Decreased Potential |

**Table 10.6: Roost Potential Factors identified at the Existing Structures within the landholding**

The main structural features of the derelict buildings within the landholding and proposed development footprint listed above are indicative of structures of decreased potential to support roosting bats.

A daytime inspection of the structures within the proposed development footprint did not identify the presence of roosting bats or field signs indicating their presence.

The trees occurring within the proposed development footprint are dominated by small and thin stemmed trees that do not provide suitable tree roost habitat. A mature beech tree is located adjacent to the structures on site. This tree does not support features typically used by bats for roosting such as large cracks and crevices, broken limbs, hollow trunk with access or dense ivy cover. Overall the trees within the proposed development footprint are considered to have low and limited potential to support roosting bats.

***Roost Emergence Survey***

Conditions during the roost emergence survey were ideal for bat activity. Weather was dry and calm and temperatures were approximately 17℃.

No bats were observed emerging from the structures occurring within the proposed development footprint during the roost emergence survey which commenced at 21:45 and terminated at 23:00 at the structures within the proposed development footprint.

Common pipistrelle and Leisler's bat were the only species recorded and observed during the emergence survey. Common pipistrelle bats were observed approaching the derelict barns on site from the west and were seen entering the barns through the open window ope on the western elevation. At least four bats were observed entering the building and foraging within the structure during the initial period after emergence, between 22:05 and 22:35 while conditions were still bright outside. Bats were not observed foraging within the structure later during the survey after dark.

***Foraging Survey***

During the automatic monitoring at MP1 along the former hedgerow/treeline that has now developed into scrub adjacent to the northern boundary of the proposed development footprint. The monitoring point is located away from any surrounding infrastructure and night time lighting. Three species of bats were recorded. These include Leisler's bat, Common pipistrelle and Soprano pipistrelle. The results of monitoring at MP1 are provided in Table 10.7 below. A total of 2,874 bat passes were recorded in the vicinity of this monitoring point. Approximately 84% of the activity recorded at this monitoring point were Leisler's bat passes. Activity by Leisler's bat was consistent throughout the 19 nights of monitoring with a median number of 124 passes per night being registered.

| Date | MYSP | NYCLEI | PIPPIP | PIPPYG | PLEAUR | Total/Night |
|---|---|---|---|---|---|---|
| 20220602 | 0 | 51 | 27 | 1 | 0 | 79 |
| 20220603 | 0 | 80 | 8 | 6 | 0 | 94 |
| 20220604 | 0 | 23 | 0 | | 0 | 23 |
| 20220605 | 0 | 68 | 23 | 2 | 0 | 93 |
| 20220606 | 0 | 111 | 51 | 4 | 0 | 166 |
| 20220607 | 0 | 159 | 10 | 2 | 0 | 171 |
| 20220608 | 0 | 124 | 42 | 2 | 0 | 168 |
| 20220609 | 0 | 194 | 10 | 3 | 0 | 207 |
| 20220610 | 0 | 196 | 4 | 0 | 0 | 200 |
| 20220611 | 0 | 162 | 10 | 7 | 0 | 179 |
| 20220612 | 0 | 151 | 23 | 2 | 0 | 176 |
| 20220613 | 0 | 160 | 89 | 3 | 0 | 252 |
| 20220614 | 0 | 166 | 12 | 5 | 0 | 183 |
| 20220615 | 0 | 211 | 28 | 1 | 0 | 240 |
| 20220616 | 0 | 166 | 22 | 6 | 0 | 194 |
| 20220617 | 0 | 96 | 6 | 3 | 0 | 105 |
| 20220618 | 0 | 101 | 1 | 0 | 0 | 102 |
| 20220619 | 0 | 107 | 7 | 0 | 0 | 114 |
| 20220620 | 0 | 82 | 17 | 2 | 0 | 101 |
| **Total/Species** | **0** | **2408** | **390** | **49** | **0** | **2,847** |

**Table 10.7: Monitoring Results at MP1 MYSP = Myotis Species; NYCLEI = Leisler's bat; PIPNAT = Nathusius pipistrelle; PIPPIP = common pipistrelle; PIPPYG = Soprano pipistrelle; PLEAUR = brown long-eared bat**

Common pipistrelle accounted for approximately 14% of the passes recorded during monitoring at MP1. Nightly activities levels were low and ranged from no recording to a maximum of 89 passes in any one night. The median number of passes per night for Common pipistrelle was 12.

Soprano pipistrelle activity was recorded at very low levels during the survey with a maximum number of 7 passes being recorded in any one night. The median number of passes per night for Soprano pipistrelle was 2.

During the automatic monitoring at MP2 in open habitat within the recolonised grassland mosaic habitat to the east of the proposed development footprint. The monitoring point is located away from any permanent night time lighting. A total of four bat species were recorded. The results of monitoring at MP2 are provided in Table 10.7 below. A total of 1,896 bat passes were recorded in the vicinity of this monitoring point. Approximately 89% of the activity recorded at this monitoring point were Leisler's bat passes. Activity by Leisler's bat was variable throughout the 19 nights of monitoring with a minimum number of 16 passes and a maximum number 186 passes being recorded. The median number of passes recorded per night was 86.

Common pipistrelle accounted for approximately 5.5% of the passes recorded during monitoring at MP2. Nightly activities levels were low and ranged from a minimum number of 1 to a maximum of 11 passes in any one night. The median number of passes per night for Common pipistrelle was 4.

Soprano pipistrelle activity was also recorded at low levels during the survey and was in general consistently very low with only less than 5 passes being recorded during 15 of the 19 survey nights. A maximum number of 27 passes during any one night was recorded for this species during monitoring. The median number of passes per night for Soprano pipistrelle was 3.

Brown long-eared bat activity was recorded at very low levels during the survey with this species being only recorded on 2 of the 19 nights of monitoring and only 1 pass being recorded during each of these nights.

| Date | MySP | NYCLEI | PIPPIP | PIPPYG | PLEAUR | Total/Night |
|---|---|---|---|---|---|---|
| 20220602 | 0 | 16 | 1 | 0 | 0 | 17 |
| 20220603 | 0 | 45 | 10 | 4 | 1 | 60 |
| 20220604 | 0 | 39 | 4 | 3 | 0 | 46 |
| 20220605 | 0 | 59 | 3 | 2 | 1 | 65 |
| 20220606 | 0 | 86 | 10 | 3 | 0 | 99 |
| 20220607 | 0 | 82 | 1 | 0 | 0 | 83 |
| 20220608 | 0 | 86 | 1 | 2 | 0 | 89 |
| 20220609 | 0 | 86 | 4 | 0 | 0 | 90 |
| 20220610 | 0 | 44 | 2 | 0 | 0 | 46 |
| 20220611 | 0 | 124 | 5 | 3 | 0 | 132 |
| 20220612 | 0 | 162 | 10 | 27 | 0 | 199 |
| 20220613 | 0 | 154 | 11 | 21 | 0 | 186 |
| 20220614 | 0 | 157 | 11 | 6 | 0 | 174 |
| 20220615 | 0 | 186 | 10 | 17 | 0 | 213 |
| 20220616 | 0 | 87 | 9 | 4 | 0 | 100 |
| 20220617 | 0 | 45 | 3 | 1 | 0 | 49 |
| 20220618 | 0 | 45 | 1 | 0 | 0 | 46 |
| 20220619 | 0 | 78 | 5 | 1 | 0 | 84 |
| 20220620 | 0 | 111 | 4 | 3 | 0 | 118 |
| **Total/Species** | **0** | **1,692** | **105** | **97** | **2** | **1,896** |

**Table 10.8: Monitoring Results at MP2 MYSP = Myotis Species; NYCLEI = Leisler's bat; PIPNAT = Nathusius pipistrelle; PIPPIP = common pipistrelle; PIPPYG = Soprano pipistrelle; PLEAUR = brown long-eared bat**

The automatic monitoring at MP3 was completed adjacent to a treeline along the southern boundary of the landholding. This monitoring point was located in close proximity to the existing commercial facility to the south. Permanent night time lighting is in place adjacent to the southern boundary of the landholding. The existing southern boundary is not screened from this lighting. A total of four bat species were recorded. The results of monitoring at MP3 are provided in Table 10.9 below. A total of 5,289 bat passes were recorded in the vicinity of this monitoring point. Approximately 40% of the activity recorded at this monitoring point were Leisler's bat passes. Activity by Leisler's bat was recorded during each night of monitoring but was variable throughout the 15 nights with a minimum number of 17 passes and a maximum number 350 passes being recorded. The median number of passes recorded per night was 126.

Common pipistrelle accounted for approximately 48% of the passes recorded during monitoring at MP3 and was thus the most active species in the vicinity of this monitoring location. Nightly activities levels were consistent with Common pipistrelle being recorded during each night of monitoring. Activity levels ranged from a minimum number of 48 passes to a maximum number of 429 passes being recorded. The median number of passes per night for Common pipistrelle was 163.

Soprano pipistrelle activity was also recorded consistently during monitoring at MP3 and accounted for approximately 12% of the bat activity recorded. Activity levels were lower than Common pipistrelle and Leisler's bat with a minimum number of 0 and a maximum number of 92 passes being recorded.

Brown long-eared bat activity was recorded at very low levels during the survey with this species being only recorded on 4 of the 15 nights of monitoring.

| Date | MYSP | NYCLEI | PIPPIP | PIPPYG | PLEAUR | Total/Night |
|---|---|---|---|---|---|---|
| 20220602 | 0 | 64 | 429 | 31 | 0 | 524 |
| 20220603 | 0 | 350 | 183 | 37 | 1 | 571 |
| 20220604 | 0 | 52 | 58 | 9 | 0 | 119 |
| 20220605 | 0 | 176 | 85 | 22 | 0 | 283 |
| 20220606 | 0 | 217 | 144 | 21 | 1 | 383 |
| 20220607 | 0 | 75 | 70 | 45 | 0 | 190 |
| 20220608 | 0 | 126 | 48 | 40 | 0 | 214 |
| 20220609 | 0 | 78 | 89 | 18 | 1 | 186 |
| 20220610 | 0 | 54 | 113 | | 0 | 167 |
| 20220611 | 0 | 171 | 163 | 52 | 0 | 386 |
| 20220612 | 0 | 107 | 244 | 43 | 0 | 394 |
| 20220613 | 0 | 183 | 262 | 78 | 0 | 523 |
| 20220614 | 0 | 296 | 220 | 90 | 2 | 608 |
| 20220615 | 0 | 134 | 287 | 92 | 0 | 513 |
| 20220616 | 0 | 17 | 169 | 42 | 0 | 228 |
| **Total/Species** | **0** | **2,100** | **2,564** | **620** | **5** | **5,289** |

**Table 10.9: Monitoring Results at MP3 MYSP = Myotis Species; NYCLEI = Leisler's bat; PIPNAT = Nathusius pipistrelle; PIPPIP = common pipistrelle; PIPPYG = Soprano pipistrelle; PLEAUR = brown long-eared bat**

There are varying methods to quantity bat activity recorded during automatic static monitoring. Matthews et al. (2016) provided an arbitrary threshold for levels of low, medium and high bat activity. Kepel (2011) used the bat passes recorded per hour as a metric against which activity levels can be assigned. The Mammal Society have recently established EcoBat, an online database that compares bat activity recorded at a monitoring point against all other bat activity held by the database for the surrounding area. The EcoBat tool is likely to become an important tool for categorising bat activity recorded during automatic monitoring, however it is currently at an early stage and there are low numbers of bat recordings held by the database for Ireland. As such the bat activity recorded on site has been categorised in line with the method described by Kepel (2011). Kepel (2011) assigned bat activity based on bat passes per hour as follows:

Pipistrelle species and Leisler's bat: Low = <3.5 passes; Moderate = 3.6 – 6.5; High = >6.5

All Other Bat species: Low = <4.0 passes per hour; 4.1 to 10 passes per hour; high = >10 passes per hour.

A total of 371 hours of bat monitoring was completed on site (based on 53 nights of monitoring for 7 hours per night) at each monitoring point.

The overall bat activity recorded for each taxa at the three monitoring points within and bounding the proposed development footprint are provided in Table 10.10 below.

| Species | MP1 | Activity Category | MP2 | Activity Category | MP3 | Activity Category |
|---|---|---|---|---|---|---|
| Leisler's bat | 17 | High | 12 | High | 18 | High |
| Common pipistrelle | <2 | Low | <1 | Low | 23 | High |
| Soprano pipistrelle | <1 | Low | <1 | Low | 6 | Low |
| Myotis species | 0 | Low | 0 | Low | 0 | Low |
| Brown long-eared bat | 0 | Low | <1 | Low | 0 | Low |

**Table 10.10: Bat Activity Categorisation**

In summary the automatic bat monitoring recorded high levels of Leisler's bat activity at all monitoring points; low levels of Common pipistrelle activity at monitoring points MP1 and MP2 and high levels at MP3; and low levels of activity for all other species at each of the three monitoring points.

**Nature Conservation Value**

In line with Kepel's approach to quantifying bat activity, high levels of Leisler's bat activity and low levels of activity for all other species was recorded in the area within and bounding the proposed development footprint.

The presence of Leisler's bat, Common pipistrelle and Soprano pipistrelle foraging within and surrounding the proposed development footprint is not unexpected. Common pipistrelle and Soprano pipistrelle are widespread and commonly occurring throughout the country and is "commonly encountered during bat surveys" (NPWS, 2019). Common pipistrelle is also "very general in its habitat preference, foraging in woodland, riparian habitats and parkland, along linear features in farmland, and in towns and cities" (NPWS, 2019). The national population of this species is increasing and no existing pressures or threats to the conservation status of this species at a national level have been identified. Overall the future prospects for this species in terms of range, population and habitat are Good (NPWS, 2019). Leisler's bat is also abundant in Ireland, being identified as one of the most common and widespread species in Ireland. It prefers to forage over parkland, cattle pasture, meadows, tree crowns over and along woodland habitats (Russ, 2012) as well as urban areas (NPWS, 2019). The national population of this species is increasing and the overall the future prospects for this species in terms of range, population and habitat are Good (NPWS, 2019). Existing threats to this species, as identified by the NPWS, include wind energy development. and the deliberate or accidental exclusion of Leisler's bats from roosts in houses.

In light of the above and the absence of any roosting activities within the proposed development footprint or the surrounding landholding, the landholding is considered to be representative of a site of local importance for bats (Rating D).

**Marsh fritillary & Invertebrates**

***Adult Flight Survey***

No adult marsh fritillary were recorded during the transect survey of the acidic grassland habitat supporting stands *Succisa pratensis* or within the semi-improved or recolonising grassland habitats occurring within the proposed development footprint.

Other invertebrate species recorded during these surveys include: speckled wood; green-veined white; small white; common blue; meadow brown; ringlet; small tortoiseshell; common carder bee; common bumblebee; honey bee; cinnabar moth; and six-spot burnet moth.

***Succisa pratensis Web Survey***

Stands of *Succisa pratensis* were surveyed throughout the area of dry acid grassland supporting abundant Succisa pratensis. The area supporting abundant Succisa pratensis that is representative of suitable habitat for supporting marsh fritillary are shown on Figure 10.3. No marsh fritillary larvae webs were recorded at the base of *Succisa* plants during this survey.

***Marsh fritillary Habitat Condition***

Figure 10.3 provides a map detailing habitat conditions within the landholding for marsh fritillary in accordance with the Fowles marsh fritillary habitat suitability categorisation. As can be seen on Figure 10.3 the habitats occurring within the proposed development footprint are representative of either unsuitable (NS) or potential rank (PR) habitat for marsh fritillary.

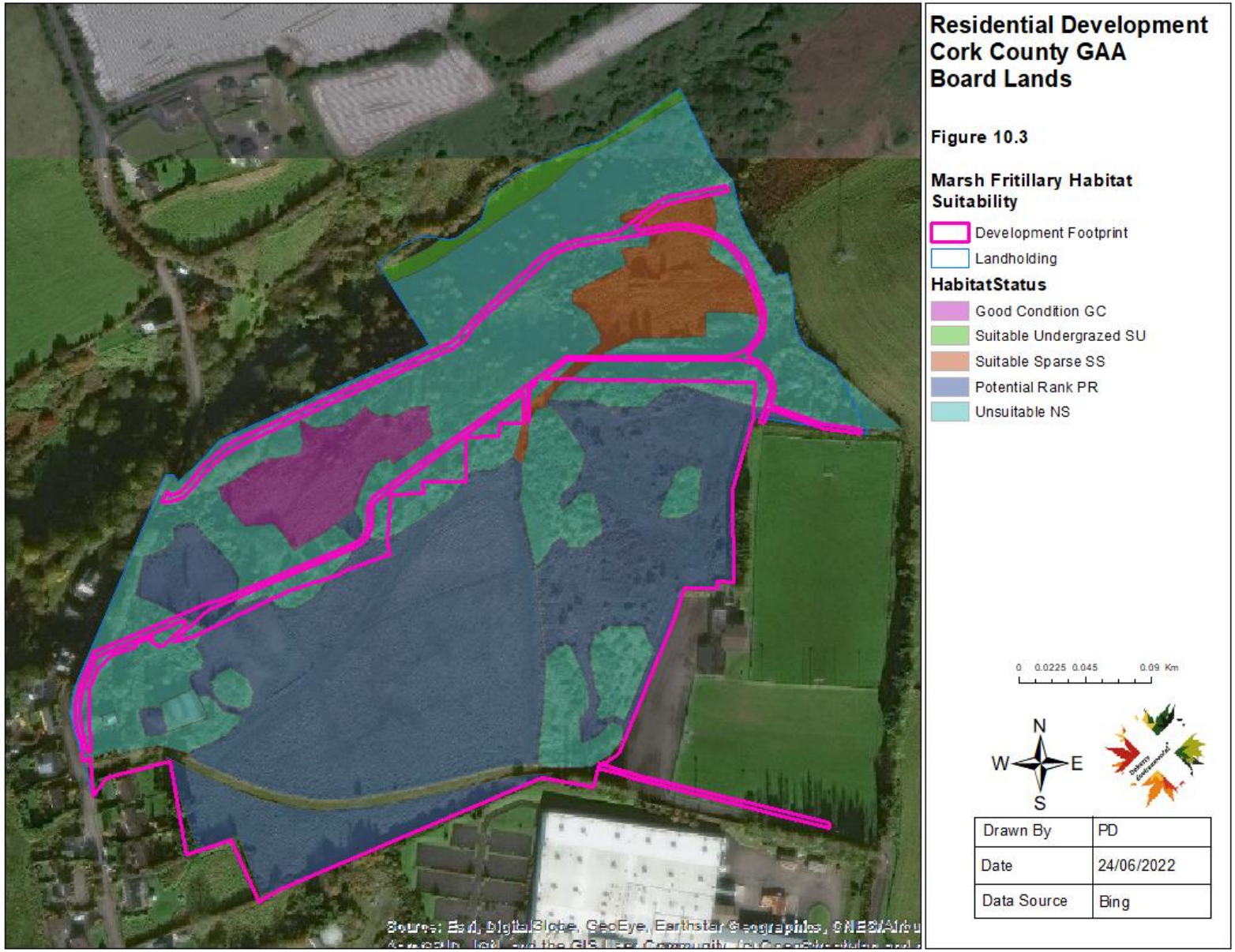
The habitat condition for marsh fritillary within the area of abundant Succisa pratensis shown on Figure 10.3 is currently representative of Good Condition Habitat (GC). This area is approximately 6500m$^2$ in size. However scrub encroachment, particularly in the form of Prunus spinosa encroachment as well as Ulex europeaus was noted during field surveys. In the absence of appropriate management this encroachment is likely to continue and over time the potential will exist for the loss of Good Condition Habitat (GC) for marsh fritillary within the landholding.

Other areas of dry acidic grassland occurring within the landholding have been identified as being representative of Suitable (Sparse) Habitat (SS) for marsh fritillary. These areas are shown on Figure 10.3 and are representative of areas of dry acid grassland where Succisa pratensis is absent. The wet grassland habitat occurring towards the northern boundary of the landholding, along the bank of the Glenamought River is representative of Suitable (Under-grazed) Habitat (SU) for marsh fritillary.

The semi-improved grassland and recolonising grassland mosaic habitat occurring within and to the north of the proposed development footprint is representative of Potential (Rank) habitat (PR). Succisa pratensis is absent from this habitat which is characterised by a tall sward over 25cm in height. All other habitats such as scrub and other woodland habitats occurring within the proposed development footprint are representative of unsuitable habitat.

**Nature Conservation Value**

While no marsh fritillary adults or larvae was recorded during surveys at the landholding this species has been recorded within the landholding to the north of the proposed development footprint in recent years, with the most recent record of this species dating from April 2019. Records for marsh fritillary in this area are held from multiple years spanning the timeframe of 1901 to 2019. Marsh fritillary is a species listed on Annex II of the EU Habitats Directive. The grassland habitat occurring to the north of the proposed development footprint in which marsh fritillary have previously been recorded support abundant stands of Succisa pratensis and is representative of habitat in good condition (GC) for support marsh fritillary colonies.


Residential Development
Cork County GAA
Board Lands
Figure 10.3
Marsh Fritillary Habitat
Suitability
Development Footprint
Landholding
HabitatStatus
Good Condition GC
Suitable Undergrazed SU
Suitable Sparse SS
Potential Rank PR
Unsuitable NS
0 0.0225 0.045 0.09 Km
N
W
E
S
Drawn By PD
Date 24/06/2022
Data Source Bing

This habitat that the colonies of marsh fritillary that are known to rely upon this habitat are representative of a receptor of county level nature conservation value (Rating C).

**Amphibians**

No amphibians have been recorded within the proposed development footprint or landholding during field surveys.

**Fisheries**

The Glenamought River is known to support a good population of wild brown trout and is also known to support spawning river lamprey, a species listed on Annex II of the EU Habitats Directive. Populations of these species supported by the river, as well as otter populations are representative of receptors of county importance (Rating C).

## 10.3 Potential impact of the proposed development

### 10.3.1 Do nothing scenario

In the event of the do-nothing scenario and the continuation of current relaxed land management practices within the landholding and proposed development footprint it is likely that:

The proposed development footprint and areas to the north will continue to be used as a recreational walking and dog walking area by the public;

Scrub in the form of spreading Prunus spinosa and Ulex europeaus will continue to encroach upon dry acidic grassland habitat to the north of the proposed development footprint with potential detrimental effects for the area of marsh fritillary habitat in good condition habitat;

Scrub in the form of Salix aurita, Ulex europeaus and Buddleja davidii will continue to spread and colonise the area of recolonised grassland mosaic habitat to the east of the project site.

### 10.3.2 Impacts

**Construction phase**

***Designated Conservation Areas***

There will be no direct impacts to designated conservation areas occurring in the surrounding area. The potential impact of the project to European Sites occurring in the wider surrounding area has been assessed as part of a Screening Report for Appropriate Assessment and an Natura Impact Statement, both of which are provided under separate cover. A highly precautionary approach was adopted during the examination detailed in these documents and it was found that, in the absence of appropriate mitigation measures, the construction phase of the project will have the potential to combine with other existing sources of water quality pressures to the River Lee catchment and result in additive adverse effects to the status of the River Lee Estuary of the Cork Harbour SPA downstream.

The Cork Harbour SPA is also listed as a pNHA and it is considered that the findings of the Screening for Appropriate Assessment and Natura Impact Statement that accompany the planning application are also applicable to the Cork Harbour pNHA.

No other NHAs or pNHAs occurring in the wider surrounding area are connected to the project via potential impact pathways and there will be no potential for the construction phase of the project to result negative effects to NHAs or other pNHAs.

***Habitat Loss***

The land cover changes associated with the proposed scheme will be the loss of areas of semi-improved grassland, recolonising grassland mosaic and scrub within the proposed development footprint.

Each of these habitats occurring within the project site has been evaluated as being of low nature conservation importance (Rating E). The loss of these habitats to the footprint of the project will represent a high magnitude impact to these habitats. A high magnitude impact to these habitats of low nature conservation value will represent an impact of minor negative significance.

It is noted that there will be no loss of hedgerow/treeline habitat along the northern and southern boundaries of the proposed development footprint.

There will be no loss of suitable (GC) marsh fritillary to the footprint of the proposed development. The provision of underground and horizontal directional drilled pipework for the proposed operation phase surface water drainage infrastructure will ensure that the project does not result in disturbance to habitat upon which marsh fritillary rely.

***Habitat Disturbance***

The proposed development footprint will be located at a remote distance from the nearest point of the Glenamought River (located over 100m to the north, while the proposed bicycle trail will be located approximately 60m from the river) and this buffer distance will ensure that the construction phase of these elements of project do not pose a risk to the status of this river and the aquatic species that it supports.
As part of the project it is proposed to construct a natural stream corridor to the north of the proposed development footprint that will connect into the left-hand bankside of the Glenamought River. It is proposed to provide connect the constructed stream corridor using a soft engineering approach that avoids the use of hard engineering infrastructure such as headwall. Nevertheless during the establishment of the new channel and in the absence of an appropriate approach to the construction of the new stream channel and its connection to the Glenmought River there will be potential for localised disturbance to the river bank and instream habitats. Such impacts associated with these works to the Glenamought River are predicted to be temporary and low in magnitude and will have the potential to result in an effect of minor negative significance for this watercourse.

In the absence of appropriate site management during the construction phase the potential will exist for the disturbance of dry acidic grassland and suitable (GC) marsh fritillary habitat occurring to the north and east of the proposed development footprint. Such disturbance will have the potential to arise as a result

of construction phase plant and machinery movements in the dry acidic grassland habitat supporting suitable (GC) marsh fritillary habitat.

The horizontal directional drilling of the operation phase surface water pipework under the area of suitable marsh fritillary habitat will not result in disturbance to this habitat. The pipe will be installed within the bedrock, below soil and subsoil level and will not result in any changes to overburden and land cover that support suitable (GC) marsh fritillary habitat.

***Spread of Non-native Invasive Species***

The presence of non-native invasive species has been identified within the project site. In the absence of an appropriate approach and biosecurity measures to excluding and eradicating these species the construction works will have the potential to result in their spread in the area surrounding the landholding as well as offsite as a consequence of construction vehicle movements.

***Non-volant Mammals***

No breeding sites or resting places of protected terrestrial non-volant mammals such as badgers were noted within or immediately adjacent to the project site. As such the construction phase of the project will not have the potential to result in significant disturbance to non-volant terrestrial mammals.

No otter holts or couches or evidence indicating the presence of otters and couches were recorded during field surveys along the stretch of the Glenmought River to the north, northeast and northwest of the landholding. Given the absence of breeding and resting places there will be no potential for the project to result in disturbance to such otter habitat. The construction works associated with the connection of the new constructed stream to the Glenamought River is predicted to represent an imperceptible magnitude impact for otters that may foraging along this stretch of the river. This is based on the predominantly crepuscular nature of otter activity along watercourses and the absence of any works overlapping with times of dusk/dawn and night time in the vicinity of the Glenamought River. Furthermore it is noted that the works associated with the connection of the constructed stream to the Glenamought River will be short lived and are expected to be completed within 3 to 4 days.

***Bats***

The project will not result in any direct or indirect disturbance to bat roosts.

The project will result in the loss of the grassland and scrub vegetation. High levels of Leisler's bat activity were recorded over these habitats while high levels of both Leisler's bat and Common pipistrelle were recorded along the southern boundary of the landholding and proposed development footprint. The loss of these habitats will result in the loss of suitable foraging habitat for these species.

In order to assess the implications of the loss of habitat relied upon by the local Leisler's bat and Common pipistrelle population a review of habitats occurring in the wider area surrounding the project site was completed to identify the extent of potential high value foraging habitat available for both species. This review was completed using GIS and Bing satellite imagery to identify and map areas of suitable foraging habitat for Leisler's bat and Common pipistrelle. Leisler's bats are known to rely on a core sustenance zone of 3km while the core sustenance zone of Common pipistrelle is 2km (Bat Conservation Trust, 2020) and

while these species were not found to roost within the project site, for the purposes of the habitat loss assessment, all potentially suitable foraging habitats for Leisler's bat and Common pipistrelle within a 3km and 2km radius of the project site were identified. Both Leisler's bat and Common pipistrelle are known to forage in a wide variety of habitats with preference for woodland habitats and grassland habitats (Bat Conservation Trust, 2020; Russ, 2012). In order to inform the habitat loss assessment only larger areas of woodland and grassland habitat were mapped as potentially suitable foraging habitat. The areas identified as representing suitable foraging habitat for Leisler's bat and Common pipistrelle are shown on Figure 10.4 below.

The total area mapped as suitable foraging habitat for Leisler's bat within 3km radius of the proposed development footprint amounts to approximately 1,400Ha. Given that the extent of suitable foraging habitat loss as a result of the construction phase of the proposed development amounts to approximately 9Ha in size (i.e. the approximate size of the proposed development footprint), the loss of these habitats as a result of the development will amount to a loss of circa 0.5% of the mapped area of suitable foraging habitat within a 3km radius of the project site.

The total area mapped as suitable foraging habitat for Common pipistrelle within 2km radius of the proposed development footprint amounts to approximately 675Ha. Given that the extent of suitable foraging habitat loss as a result of the construction phase of the proposed development amounts to approximately 9Ha in size (i.e. the approximate size of the proposed development footprint), the loss of these habitats as a result of the development will amount to a loss of circa 1.3% of the mapped area of suitable foraging habitat within a 3km radius of the project site.

The extent of habitat loss for both Leisler's bat and Common pipistrelle, will represent a low magnitude impact to the local Leisler's bat and Common pipistrelle populations. A low magnitude impact to the local Leisler's bat and Common pipistrelle populations, which are considered to be of high local conservation value (Rating D), will represent an impact of minor negative significance.

Low levels of bat activity for all other bat species were recorded during monitoring. The results of the monitoring indicates that the habitats occurring within the proposed development footprint are not relied upon as a foraging resource by these other bat species and their loss will have an imperceptible impact on these species of local conservation value (Rating D). An imperceptible magnitude impact to the local populations of other bat species will represent an effect of negligible significance.

**Birds**

The proposed development will result in the loss of grassland and scrub habitat that have the potential to support a range of birds including yellowhammer. Yellowhammer or other amber listed species were not identified to be nesting within areas of scrub or other woodland habitat that will be lost during the construction phase of the proposed development.

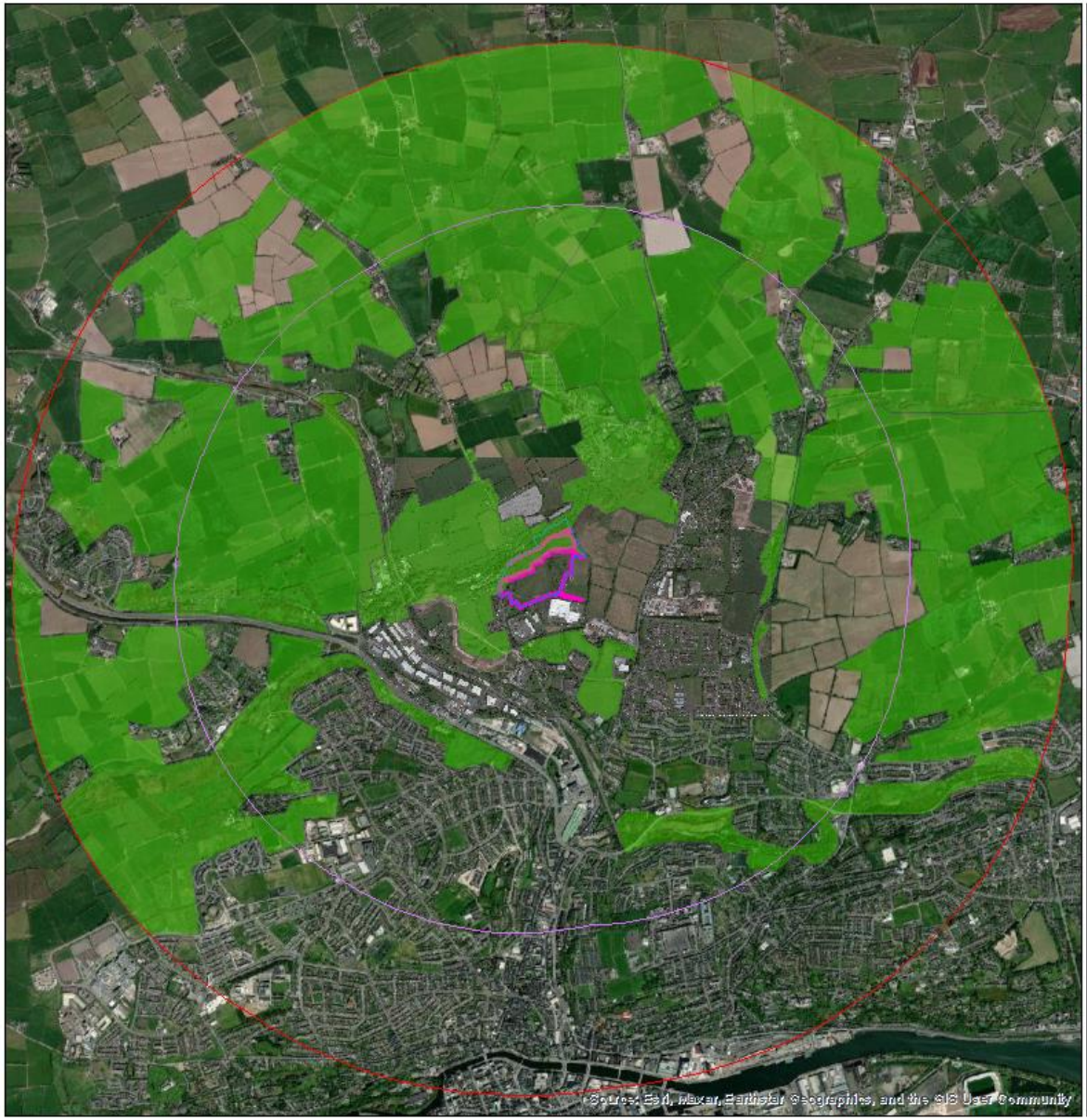
The semi-improved grassland supports uncultivated cereal species in the form of oat grasses and other seed baring species that provide some foraging resource for yellowhammer. There will be a loss of such habitat to the proposed development footprint. It is noted that there are other areas of cultivated/set aside land, surrounding the landholding that offers suitable and preferred yellowhammer foraging habitat.

Figure 10.5 shows the extent of suitable and favoured yellowhammer foraging habitat occurring in the vicinity of the proposed development footprint. The total extent of suitable yellowhammer habitat occurring within and surrounding the proposed development footprint amounts to approximately 120Ha, of which 2.3Ha occur within the proposed development footprint. The loss of this area of habitat to the proposed development footprint will amount to approximately 2% loss of suitable yellowhammer habitat.

In addition it is noted that the latest breeding population estimate for yellowhammer in Ireland (for the years 2011 – 2016) is estimated to be 217,252 (Lewis et al. (2019). The presence of a possible breeding pair at or in the vicinity of the proposed development footprint represents <1% of the national population. Given the low percentage loss of habitat for yellowhammer to the proposed development footprint in the context of the available area of suitable habitat in the surrounding area, and the population of this species at/in the vicinity of the proposed development footprint, it is considered that the loss of suitable foraging habitat for this species will represent an effect of minor significance. It is further noted that as part of the landscape and biodiversity habitat management for the operation phase of the landholding additional open meadow grassland habitat, with an abundance of cereal crop species will be provided in areas treated for long grass meadow. Further details on this measure are provided in Section 14.4 below.

In terms of impacts to other passerine species it is noted that these species are typically short-lived with high reproduction rates and are not generally considered to be sensitive to construction effects (Langston et al., 2012). However, the absence of appropriate mitigation measures and consideration of birds during the breeding season, construction works could result in disturbance to breeding territories of other bird species of medium and low conservation concern. Potential impacts include disturbance to nest and injury to eggs and chicks and the loss of nesting and foraging habitat. Given the low sensitivity rating of the proposed development footprint for bird species such potential impacts will be representative

Overall the proposed development footprint is considered to be of an area of low sensitivity for all other species and the loss of these habitats will represent an impact of low significance for other bird species.




**Residential Development Cork County GAA Board Lands**

**Figure 10.4**

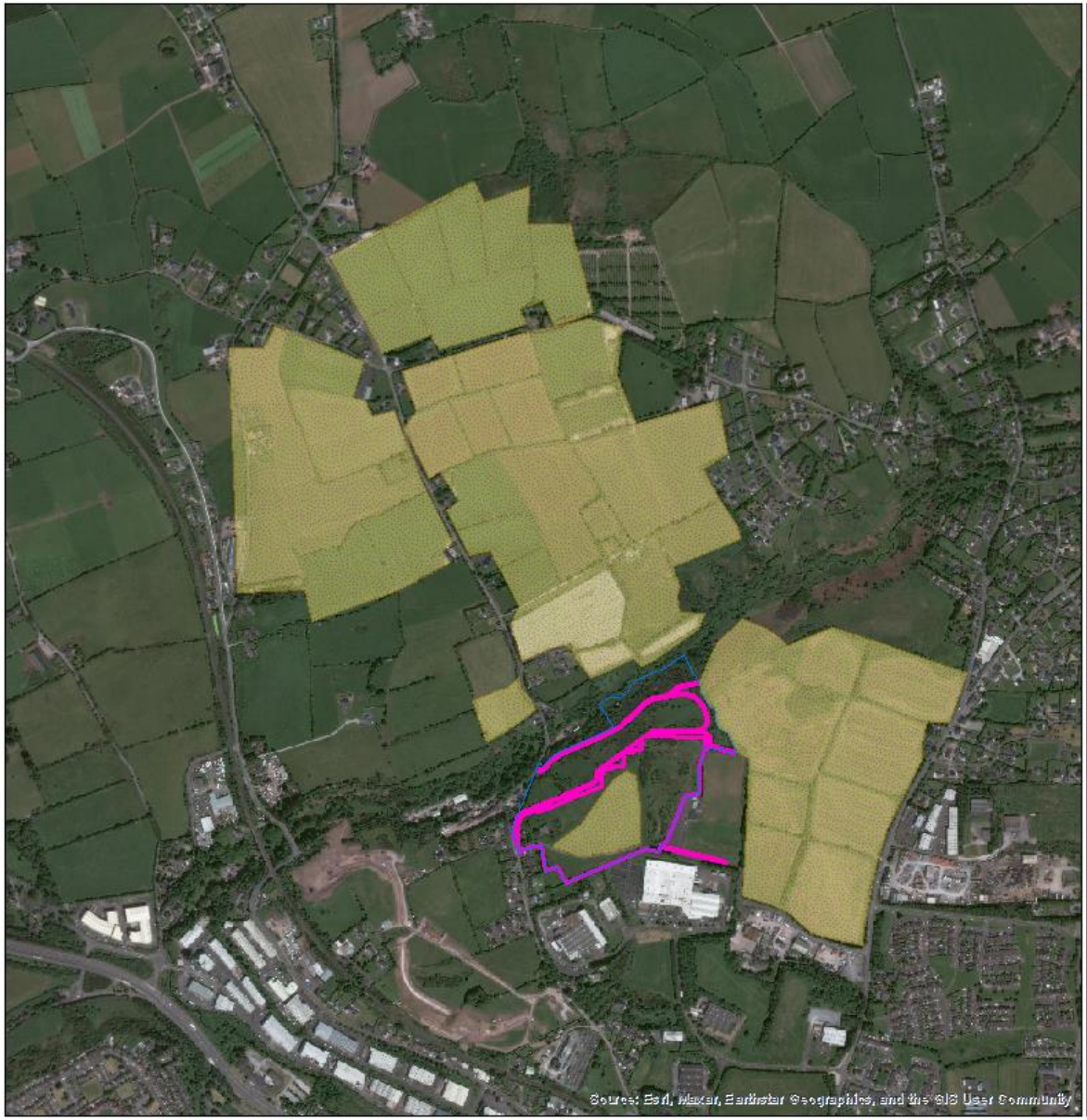
**Suitable Foraging Habitat In the CSZ for Leisler's & Common Pipistrelle**

- Suitable Foraging Habitat
- 2km Buffer - C. Pipistrelle CSZ
- 3km Buffer - Leisler's CSZ
- Landholding
- Development Footprint

0 0.25 0.5 1 Km

N W E S

| | |
|---|---|
| Drawn By | PD |
| Date | 24/06/2022 |
| Data Source | Bing |




**Residential Development Cork County GAA Board Lands**

**Figure 10.5**

**Suitable Yellowhammer Foraging Habitat**

Suitable Arable & Set Aside Habitat
Landholding
Development Footprint

0 0.1 0.2 0.4 Km

N
W E
S

| | |
|---|---|
| Drawn By | PD |
| Date | 24/06/2022 |
| Data Source | Bing |

***Marsh fritillary & Invertebrates***

Any disturbance to suitable marsh fritillary to the north of the proposed development footprint will have the potential to result in temporary, moderate magnitude impacts to marsh fritillary and their habitat. Such an impact will represent an effect of major negative significance given the county level nature conservation value of the marsh fritillary population supported by this habitat.

There will be no loss of suitable marsh fritillary to the proposed development footprint. The loss of habitat within the proposed development footprint will represent a moderate magnitude impact to other invertebrate species, which are of local value (Rating D). This will represent an effect of minor significance to other invertebrate populations.

***Aquatic Fauna***

In the event of the emission of deleterious surface water runoff from the project site to the Glenamought River and further downstream to the River Lee there will be potential for such emissions to combine with existing pressures to water quality to result in additional cumulative pressures to aquatic fauna supported by the watercourses downstream of the project site.

**Operational phase**

***Designated Conservation Areas***

There will be no direct impacts to designated conservation areas occurring in the surrounding area during the operation phase. The potential impact of the operation phase of the project to European Sites occurring in the wider surrounding area has been assessed as part of a Screening Report for Appropriate Assessment and an Natura Impact Statement, both of which are provided under separate cover. A highly precautionary approach was adopted during the examination detailed in these documents and it was found that, in the absence of appropriate mitigation measures, the operation phase of the project will have the potential to combine with other existing sources of water quality pressures to the River Lee catchment and result in additive adverse effects to the status of the River Lee Estuary of the Cork Harbour SPA & pNHA downstream.

No other designated conservation areas are connected to the project via pathways and there will be no potential for the operation to result in negative impacts to other European Sites, NHAs or pNHAs.

***Habitat Loss***

The operation phase of the development will not result in any further habitat loss within the project site.

***Habitat Disturbance***

In the absence of appropriate designs and mitigation measures the operation phase will have the potential to result in disturbance to habitats occurring within the landholding to the north of the proposed development footprint. Disturbance to dry acidic grassland habitat, areas of suitable (GC) marsh fritillary habitat and scrub and woodland habitat could arise during the operation phase as a result of recreational activities generated by the increase human population associated with the residential development. Trampling, dog walking and associated dunging could result in changes to the habitat structure and composition within the dry acid grassland.

An examination of the potential for the proposed dwelling structures to result in disturbance to suitable (GC) marsh fritillary habitat as a result of shading and changes to abiotic conditions during the operation phase has been undertaken. A shadow analysis has been completed so that the potential impact of shading generated by proposed residential structures to the south of the marsh fritillary habitat could be evaluated. This analysis has been completed for a series of dates throughout the year. The dates for which analysis has been undertaken are listed on Table 10.11 and include the solstice, equinox, and dates between the equinox and solstice so that a representative sample of potential shading effects were analysed as part of the overall shadow analysis. Table 10.11 summarises the results of the shadow analysis. Appendix 10.1 provide the graphic result outputs of the analysis.

| Date | Time of Day when a shadow is cast | % Shading of Marsh fritillary GC Habitat |
|---|---|---|
| **3rd February** | 11:00 - 12:00 | 16.0 |
| | 12:00 - 13:00 | 6.5 |
| | 13:00 - 14:00 | 3.0 |
| **21st March & September** | 08:00 - 09:00 | Not calculated |
| | 09:00 - 10:00 | 28.0 |
| | 10:00 - 11:00 | 4.0 |
| **5th May & 7th August** | 08:00 - 09:00 | 23.0 |
| | 09:00 - 10:00 | 6.0 |
| | 10:00 - 11:00 | 0.5 |
| **21st June** | 07:00 - 08:00 | 8.0 |
| | 08:00 - 09:00 | 3.0 |
| | 09:00 - 10:00 | 0.5 |
| **7th November** | 10:00 - 11:00 | Not calculated |
| | 11:00 - 12:00 | 10.8 |
| | 12:00 - 13:00 | 4.0 |
| **21st December** | 12:00 - 13:00 | 11.0 |
| | 13:00 - 14:00 | 10.0 |
| | 14:00 - 15:00 | 4.5 |

**Table 10.11 Summary results of the shadow analysis.**

The analysis shows that shading of the marsh fritillary suitable habitat (GC) area as a result of structures associated with the proposed development will be restricted to three hours during any of the dates examined. The highest level of shading will arise during the spring and autumn equinox between 09:00 and 10:00 when 28% of the marsh fritillary suitable habitat (GC) area will be shaded by the structures. This shading will be ephemeral and will be reduced to very low levels in the next hour, with no further shading for the remainder of the day. Given that 12 hours of daylight occur during the equinox and that shading will arise in the suitable area during only two of these hours, at rates of 28% and 4% of the suitable habitat area, it is considered that the levels of shading during equinox and this time of the year will be miniscule in the overall context of overall potential unshaded conditions.

The levels of shading will also be low during the winter season, when the hours of daylight are at their shortest. For instance on the winter solstice shading will arise within the suitable habitat area during 3 hours. The levels

of shading in this area over the 3 hour period will be low from a maximum of 11% to a minimum of 4.5%, whilst c.5 hours of the c.8 hours of daytime during the winter solstice will remain unshaded.

Overall the analysis indicates that for the majority of daylight hours during all dates analysed the structures associated with the proposed development will not result in shading of the marsh fritillary habitat and when shading occurs it will be ephemeral and will result in overall minor areas (generally <10%) of the suitable habitat area being cast into shade.

It is also noted that percentage shading has not been calculated for certain hours during the analysis. This is due to the fact that the marsh fritillary suitable habitat (GC) area is situated on a steep slope with a north facing aspect and when the sun is low in the sky and shining along a near horizontal plane, the slope itself will be in shade.

Overall the results of the shadow analysis indicate that shading arising from the structures will have the potential to result in a miniscule reduction in the direct sunlight penetration to the marsh fritillary suitable habitat (GC) area. This miniscule reduction sunlight penetration will represent an impact of imperceptible magnitude to the status of this habitat to function as a host habitat area for marsh fritillary larvae. An imperceptible impact to this receptor of county level nature conservation value will represent an effect of minor negative significance.

***Non-volant Mammals***

The operation phase of the project is not predicted to have the potential to result disturbance to protected terrestrial non-volant mammals. This is due to the absence of any evidence of protected terrestrial non-volant mammals within the project site during field surveys and the low value habitats within the project site for bird species.

***Bats***

Bat species occurring in the vicinity of the project site are known to be sensitive to artificial lighting. The project has been designed to minimise disturbance from artificial night time lighting to the existing boundary vegetation associated with the hedgerows, treelines and woodland. This has been achieved by setting back housing, access roads and lighting columns from high value bat foraging habitats, and particularly woodland, the riparian corridor of the Glenamought River and the meadow grassland habitats to be provided, retained and/or enhanced to the north of the project site. This approach will minimise the potential for lighting to alter foraging habitat along the boundary corridors used by bats. Further measures for reducing the effects of lighting on bats are outlined in Section 14.4 below.

***Birds***

The potential for the operation phase of the proposed development to result in disturbance to the local bird assemblage will be restricted in its extent due to the presence of existing roads and built lands to the west and south and the nature of the proposed development which will involve residential dwelling and associated activities which will not generate significant levels of ongoing disturbance to birds relies on surrounding greenfield habitats to the north and east of the proposed development.

***Marsh fritillary & Invertebrates***

Potential operation phase impacts to marsh fritillary in terms of changes to abiotic conditions in the form of sunlight penetration have been considered above in the context of potential disturbance impacts to suitable (GC) marsh fritillary habitat.

In the absence of appropriate management of the landholding during the operation phase there is potential for increased human activity to result in disturbance in the form of trampling and dunging to this habitat. Activities that could lead to disturbance include walking, dog walking and other recreational pursuits. In the absence of specific operation phase management measures and mitigation such activities will have the potential to result in a moderate magnitude impact and an effect of moderate negative significance to marsh fritillary habitat.

***Aquatic Fauna***

In the event of the emission of deleterious surface water runoff from the project site to the Glenamought River and further downstream to the River Lee there will be potential for such emissions to combine with existing pressures to water quality to result in additional cumulative pressures to aquatic fauna, including salmonids, lamprey, otters and other fish species supported by the watercourses downstream of the project site.

## 10.4 Mitigation measures, Monitoring and Residual Impacts

### 10.4.1 Mitigation & Monitoring

The mitigation measures outlined in the following sections aim to ensure that a best practice approach to minimising ecological disturbance during the construction phase is implemented and that the design of the project's operational phase avoids significant effects the biodiversity receptors.

**Construction Phase**

***Ecological Clerk of Works***

An Ecological Clerk of Works (ECoW) as well as a Project Landscape Architect will be appointed prior to the commencement of construction. The ECoW will be an ecologist with experience of baseline ecological surveys, pre-construction surveys and construction phase supervision. The ECoW will be responsible for completing pre-construction surveys and supervising construction works and advising on the implementation of biodiversity enhancement measures that will be commenced during the construction phase.

Pre-construction surveys required in advance of the construction phase will include as a minimum:

- Otter surveys along the Glenamought River – surveys to be completed a minimum distance 150m upstream and downstream of the proposed confluence point of the new constructed stream and the Glenamought River.
- Bat surveys of the structures occurring within the proposed development footprint that are to be demolished; and
- Marsh fritillary suitable habitat surveys and mapping of the abundance of Succisa pratensis within the landholding.

The ECoW will ensure that best practice construction methods and mitigation measures detailed in this EIAR and accompanying planning documentation including the Construction Environmental Management Plan (CEMP) and Natura Impact Statement are implemented in full.

The ECoW will be responsible for ensuring that the construction phase contractor is aware of key biodiversity receptors, such as marsh fritillary habitat, the Glenamought River and associated protected fauna including river lamprey, brown trout and otters; breeding bird species and particularly red listed species such as yellowhammer. The ECoW will inspect the construction works throughout the construction phase and will pay particular attention to the implementation of all biodiversity related mitigation measures.

The ECoW will provide monitoring inspection reports during the construction phase and will also provide a close-out report following the completion of the contract construction works.

Where necessary the ECoW will liaise with relevant authorities such as Cork County Council, the IFI and the NPWS with respect to construction phase activities that relate to biodiversity.

As part of the ECoW terms of appointment, the ECoW will be vested with the authority to stop works where activities have been identified on site that are not in accordance with the mitigation measures outlined in this EIAR, the Natura Impact Statement and/or the CEMP prepared for the planning application for the proposed development.

***Protected Species Licensing***

At the time of writing no requirement for protected species licences have been identified for biodiversity receptors that may require such licences to permit disturbance to breeding or resting sites. The ECoW will be required to complete pre-construction surveys in advance of the commencement of construction works and based upon the results of these surveys the ECoW will establish whether or not there is a need at that stage for protected species licences. An example of where such a need could arise is where an otter holt becomes established in the immediate vicinity of the proposed new constructed stream with the Glenamought River or in the even that the structures on site are being used as a bat roost.

***Measures to Minimise Impacts to Habitats***

Construction work will be confined strictly to within the direct land-take of the proposed development footprint. Only works relating to landscaping biodiversity habitat enhancement measures will be permitted to be completed outside the footprint of the proposed development footprint .

Construction machinery will be restricted to site roads and the footprint of the proposed development.

Habitats to be retained and enhanced on site will be identified to the contractor in advance of the commencement of construction works. These habitats will be marked out on site drawing that will identify them as Ecological Sensitive Zones (ESZs). The ESZs will comprise:

- Areas of dry acidic grassland identified as marsh fritillary suitable habitat (GC)'
- Area of woodland habitat to the retained and enhanced;
- Other areas of existing dry acidic grassland that will be treated as open meadow grassland for the operation phase.

The ESZs will be fenced off prior to the commencement of construction works and no construction works, with the exception of works relating to the implementation of landscape and biodiversity habitat enhancement measures will be permitted to take place in these ESZs.

In addition to the above it is noted that the design of the project has ensured that direct impacts and disturbance to marsh fritillary suitable habitat (GC) will be avoided during the construction phase. This has been achieved by siting the main surface water underground attenuation tank for the scheme to the west of and outside the footprint of this habitat and the proposal to use horizontal directional drilling techniques to install an underground drain pipe northeast from the attenuation tank to the start of the new constructed stream. The use of horizontal directional drilling under the area of marsh fritillary suitable habitat (GC) eliminates the required for the excavation of a surface water trench and new surface channel within this habitat and thus avoids direct loss and disturbance to this habitat. It is noted that the horizontal directional drilling will be completed within the underlying bedrock below subsoil and soil levels and will not result in any changes to edaphic conditions supporting abundant swards of Succisa pratensis in this area.

***New Constructed Stream***

The proposed new constructed stream will be constructed in the following sequence to avoid/minimise the potential for disturbance to the Glenamought River and the potential for the loss of silt from the newly constructed channel to river.

The new constructed stream channel will be excavated to within 2m of the Glenamought River. The bankside at the Glenamought River will be retained and remain in place during the excavation of the new stream channel alignment. A temporary silt fence will be installed at the end of the excavated constructed stream alignment at the "upstream" side of the remaining 2m retained bankside buffer. The silt fence will be installed in accordance with CIRIA guidelines.

The angle of connection of the new constructed stream channel to the Glenamought river will face downstream. This will contribute to maintaining current flow rates along the river.

The new constructed stream channel bed will be finished with a natural sand, stone and cobble bed. Larger boulders will be places along the channel to ensure that the finished bed material is retained in the channel and does not become washed away. Given that flows along the new constructed channel will be retained to low rates, at greenfield runoff rates, the potential for bed material to become washed away will be low. The provision of meander sections along sloping ground will also limit the potential for washout of bed material. In order to further maintain the integrity of the natural bed material to be provided along the stream boulders will be placed along the channel to further retard flows and any potential for wash out of bed material.

The bank side will be consolidated with vegetation that will include native hydrophilous species, tolerant of drying out. It is noted that the new stream channel is likely to dry out during extended periods of dry weather when surface water runoff from the proposed development footprint is low or absent.

Once the bed is installed and the bankside is vegetated the new stream will be connected to the Glenamought through the removal of the final 2m section of bankside. Boulder rip-rap will be installed at the connection point to ensure that the confluence between the new constructed stream and the river is maintained. Once these steps are completed the silt fence installed along the new constructed stream channel will be removed.

The timing of works for the final connection of the new constructed stream to the Glenamought River will coincide with the open season for instream works.

A final method statement will be required to be prepared by the site contractor prior to the commencement of any works for the new stream channel and the connection to the Glenamought River. The method statement will be required to incorporate the above measures as part of the approach to the installation of the new stream channel.

The contractor will be required to liaise with Inland Fisheries Ireland (IFI) and the method statement of the new stream works will be provide to the IFI. The works will be implemented only where the IFI have indicated their satisfaction with the proposed approach to the works as set out in the method statement.

***Measures to Safeguard Water Quality***

The management of surface water during the construction phase will adhere to the recommendations of the CIRIA guides *Control of Water Pollution from Construction Sites* (2001) and *Control of Water Pollution from Linear Construction Projects* (2006)

During construction key requirements for control of chemical pollution risk will include:

- Storage – all equipment, materials and chemicals will be stored away from any watercourse. Chemical, fuel and oil stores will be sited on impervious bases and within a secured bund of 110% of the storage capacity, within the lay down area;
- The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall also be tested and demonstrated.
- All fuel oil fill areas will have an appropriate spill apron.
- Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, well away from any surface watercourse;
- Maintenance – maintenance to construction plant will not be permitted on site, unless vehicles have broken down necessitating maintenance at the point of breakdown. All necessary pollution prevention measures will be put in place prior to commencement of maintenance in this instance;
- Concrete - Wet concrete operations would not be carried out within watercourses or adjacent to watercourses. Runoff from wastewaters or contaminated storm water will be directed to drains installed as part of the surface water management plan;
- Mess, sanitation and welfare facilities will be required during construction and will be located at the construction compound. Foul effluent will make use of chemical facilities with periodic removal for offsite disposal.
- Silt fences will be used during construction works in the vicinity of the Glenamought River and will be installed in line with the measures for the proposed new constructed stream detailed above.

***Measures to Minimise Impacts to Breeding Birds***

Where possible vegetation to be cleared onsite will be completed outside the nesting bird season between March and August inclusive. Where it is not possible to time such works outside these months then a survey of hedgerow/treeline/grassland vegetation and habitats for the presence of nesting birds will required to be completed prior to the commencement of vegetation removal by an experienced ecologist. This will involve a

detailed inspection of the vegetation to be removed for the presence of nest. Particular attention will be required to be given to establishing the presence of yellowhammer nest sites or nests of other red or amber listed bird species. In the event that nests are identified in hedgerow/treeline/grassland vegetation their clearance/removal will be postponed until it is confirmed that the nest sites are no longer active or after the breeding bird season terminates. While the nest is active an appropriate exclusion zone will be implemented around the nest by the ECoW and the contractor will be advised of the exclusion zone. In the event that it is not possible to postpone such works, then they will only be allowed to proceed following consultation with the NPWS, and where required, upon receipt of a licence from the Department/NPWS permitting the destruction of the nests.

Noise mitigation measures will be implemented during the construction phase and these measures are detailed in Chapter 8 of this EIAR. The noise mitigation measures will be implemented with the aim of minimising noise levels throughout the construction phase. The implementation of these measures with also minimise the potential for noise disturbance to bird species, as well as other fauna occurring in the vicinity of the site.

***Measures to Minimise Impacts to Breeding Birds***

Wherever possible night time lighting will be avoided during the construction phase of the project and particularly so during the bat activity season between the months of mid-March to mid-October. Given that it is envisaged that working hours for the construction phase will be from 07:00 to 18:00 subject to any conditions set down by An Bord Pleanála/Cork City Council, it is unlikely that the construction phase night time lighting will be required during the bat activity season. Nevertheless in the event that lighting is required, mobile lighting standards will be positioned away from high value bat foraging habitat in the form of structured vegetation (i.e. woodland, hedgerows and/or treelines). The mobile lighting standards will comprise directional lighting that will prevent light spill to such habitats. Lighting accessories such as hoods, cowls and louvres will also be available and used as required to prevent light spill to such habitats.

***Measures to Avoid the Spread of Non-Native Invasive Species***

A non-native invasive species management plan has been prepared for the proposed development construction phase. All measures detailed in this plan will be implemented in full.

**Operational Phase**

***Measures to Protect, Maintain & Enhance Marsh Fritillary Habitat***

The area of currently identified marsh fritillary suitable habitat (GC) occurring within the landholding will be subject to specific landscape and habitat management measures during the operation phase.

A boundary will be placed around this habitat in the form of a protective boundary that will deter recreational walking, dog walking and other recreational activities within this area. Information will be provided for residents of the proposed development and surrounding area highlighting the sensitivity of the habitat the need for sensitive land management of the habitat.

The area to be enclosed within the boundary amount to approximately 9,400m$^2$. This area will be managed for marsh fritillary and the successful management of this area as a suitable marsh fritillary habitat will result in an increase of approximately 2,900m$^2$ of area of suitable marsh fritillary habitat within the landholding.

In addition to this areas other areas of unenclosed meadow that will be treated as short sward meadow will also be managed to promote suitable habitat conditions for supporting colonies of marsh fritillary.

These areas will be managed to maximise its potential to function as suitable habitat for marsh fritillary. The abundance of marsh fritillary will be maintained in the existing c. 6,500m$^2$ of suitable marsh fritillary habitat within the enclosed area and the colonisation of remaining areas within the enclosed meadow area by Succisa pratensis will be promoted. The areas of short sward open meadow elsewhere will be managed to promote the growth of abundant Succisa pratensis in the sward. Both areas will be seeded with Succisa pratensis, with seed being collected from the existing stands of Succisa pratensis occurring within the landholding. An experienced botanist/horticulturalist will be engaged to collect and seed these areas with Succisa pratensis. The seeding will be completed during the latter stages of the construction phase and will form part of the construction phase contract and associated landscape works. Other vascular plants that will form part of the sward mix will include adult food plants comprising Cardamine pratensis, Ranunculus repens, Ranunculus acris, Centaurea nigra, Cirsium species, Taraxacum officinalis agg. and Hieracium/Hypochoeris species.

During the operation phase abundant Succisa pratensis will be maintained in the enclosed meadow area and the area of open meadow treated as a short sward. Sward heights will be maintained at less than 25cm in height as a patchwork of short sward at circa 10cm and higher sward to 25cm. An indication suitable habitat with a mosaic of tall and short sward vegetation between 10cm and 25cm in height is shown on Figure 10.6 below.

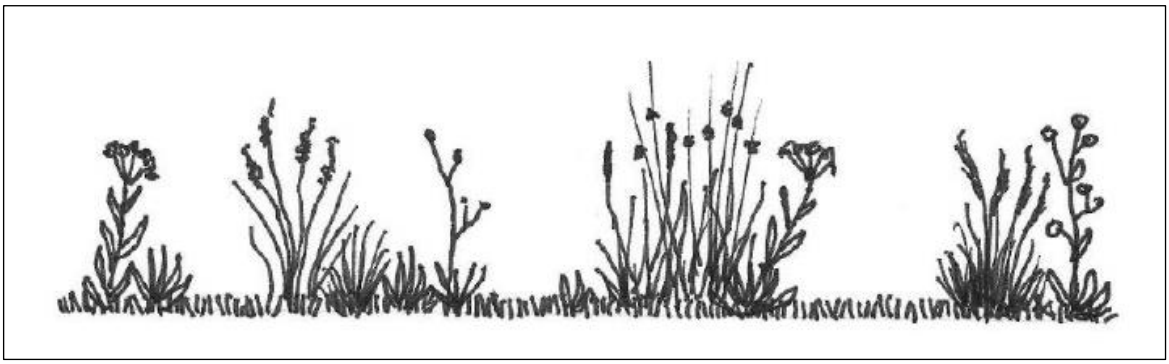


**Figure 10.6: Example of suitable marsh fritillary sward with a mosaic of tall and short sward vegetation**

Livestock grazing is recognised as the best method for the ongoing management of marsh fritillary colonies, with Phelan et al. (2021) noting that extensive grazing is the only long-term option for maintaining good quality habitat suitable marsh fritillary. Elsewhere rotational mowing has been identified as an appropriate management practice for conserving marsh fritillary habitat (INCC, 2018; Bubova et al., 2015; Van Swaay et al. 2012; Schtickzelle et al., 2005). Given the location of the enclosed meadow area and the open meadow areas to be treated with short sward in the immediate vicinity of the proposed development it will not be practical to maintain these areas in suitable habitat condition via livestock grazing methods. As such a rotational mowing regime will be required to be implemented. Rotational mowing involves successive mowing of different meadow fragments, with each single fragment being mown no more than once per year and the mowing of different fragments at different times in order to ensure heterogeneous sward height within meadows. On this basis rotational mowing will be undertaken once a year within any single fragment of the enclose meadow area and open short sward meadow area being mowed in any one year. The maximum area that can be mown within both areas at any one time will be one-third of the enclosed and open short sward meadows. Rotational mowing will be completed to leave a mosaic of small compartments that are not mown. All cuttings will be

removed from the habitat areas during mowing. Mowing will be completed in mid to late June and late September.

The enclose meadow area and the open short sward meadow area will be monitored during the operation phase for marsh fritillary habitat suitability and the presence of marsh fritillary larvae.

Suitable under-grazed (SU) habitat for marsh fritillary also occurring within the wet grassland habitat occurring at the northern end of the landholding adjacent to the Glenamought River. This area of the landholding is likely to have been subject to undergrazing in recent times following the removal of livestock from the landholding. As part of the overall management of marsh fritillary habitat within the landholding this area will also be subject to the rotational mowing regime for marsh fritillary conservation as outlined above.

Both habitat suitability surveys and larvae surveys will be completed throughout the operation phase during years 1 to 5 of operation, year 7 and again during year 10. The monitoring regime will be reviewed during year 10. Site management will be required to liaise with the Planning Authority and the NPWS during the review of the monitoring regime at year 10 so that future ongoing monitoring is agreed between site management, the Planning Authority and the NPWS.

The primary marsh fritillary habitat management target will be the maintenance of suitable marsh fritillary habitat in Good Condition (GC) as defined in Section 14.1.3 of this Chapter within the enclosed meadow area and the open short sward meadow area. The presence of marsh fritillary larvae and proof of breeding within the enclosed meadow area and the open short sward meadow area will be a target of the marsh fritillary habitat management measures to be implemented within the landholding.

***Measures to Mitigate Impacts for Yellowhammer***

In order to compensate for the loss of a small area of potentially suitable foraging habitat associated with the area of semi-improved grassland with the proposed development footprint, area of open long sward meadow will be managed to promote suitable foraging habitat for yellowhammer. This will be achieved by incorporating cereal grain species as part of the species mix of areas of the landholding to be treated as open long sward meadow. The provision of such species within this habitat will minimise the loss of suitable yellowhammer foraging habitat to the footprint of the proposed development.

***Measures to Enhance Woodland Habitat***

The woodland to be retained and planted on site will be managed throughout the operation phase. The aim of the operation phase woodland management will be to establish a native woodland within the site. The key objectives of for the operation phase woodland management:

- The management of the woodland will be overseen by professionals (forester/arborist/landscaper/ecologist) with experience in managing native woodlands. A professional will be engaged throughout the operation phase of the project to supervise the management of the woodland habitats on site.
- In areas of retained woodland the woodland will be rotated on a continuous basis to increase the percentage of native broad-leaved tree species canopy cover and decrease the percentage of scrub cover. A key aim of the woodland management will be to replace species-poor dense thicket of Ulex europeaus and Prunus spinosa with a more diverse range of native woodland species.

- Mature trees taller trees will be retained within the woodland.
- The native species to be used will be Quercus robur, Ilex aquifolium, Crataegus mongyna, Betula pubescens, Sorbus aucuparia and Prunus spinosa will be form the species mix for trees within the woodland. Planting of Fraxinus excelsior is not appropriate at this time due to the threat of ash dieback disease. The use of Fraxinus excelsior will be revisited during the operation phase of the project and where future conditions allow, this species will form part of the species mix to be planted when rotating sycamore trees.
- The rotation of mature trees will be undertaken throughout the operation phase and will be completed while still maintaining woodland cover within the retained woodland areas.
- Retain cut wood logs as stash piles on the woodland floor to provide habitat variation and decomposition matter for the woodland.
- Enhance habitat for fauna along woodland edges, particularly invertebrates including butterfly species. This will be achieved through the provision of scalloped edges to woodland habitat that increases shelter conditions for invertebrate as well as other fauna.
- Provide wildlife enhancement within the woodland during the operation phase. Enhancement measures that will be implemented during the operation phase will include the provision of bat boxes (a minimum of 3 will be provided within the project site throughout the operation phase) and bird boxes (a minimum of 3 will be provided throughout the operation phase)

***Measures to Mitigate Impacts for Bats***

The lighting design in the vicinity of habitat features that offer suitable foraging bats, such as woodland habitats to the north of the proposed development that are to be retained and enhanced will be provided as part of the project landscaping, The lighting for the proposed development has been prepared in line with best practice measures for minimising the impacts of artificial lighting to bats, as detailed in the Institute of Public Lighting 2018 guidance document Bats and Artificial Lighting in the UK. This lighting plan aims to limit lighting and light spill on to these habitats to ensure that optimum foraging conditions, that include unlit and low artificial light over the woodland and meadow grassland habitats that provide suitable habitat for bats such as Common pipistrelle and Leisler's bat.

The retention of woodland habitat within the landholding along the north of the site connecting the western and eastern extent of the landholding and along the eastern boundary connecting the south side of the landholding north to the Glenamought River will ensure that connectivity in the landscape from west to east and north to south is retained and fragmentation of the wider landscape is avoided.

***Measures to Manage Surface Water Runoff***

A surface water management design has been prepared for the proposed development and will be implemented for the operation phase. The network has been designed in accordance with the GDSDS and incorporates onsite attenuation, full hydrocarbon and silt interceptors, hydrobrakes and the discharge of surface water from the proposed development at green field runoff rates. Nature-based solutions, such as SuDS have also been incorporated into the design of the project and will further provide for the effective management of surface water runoff generated at the project site during the operation phase. As part of the nature-based solutions a new constructed stream will be provided to convey flows from the western attenuation tank and horizontal directional drilled pipe to the Glenamought River. The new constructed stream channel will provide habitat heterogeneity within the woodland areas to the north of the landholding and has

the potential to provide additional habitat for foraging habitat for invertebrates, bird and bat species. Conceptual examples of the new constructed stream are shown on Figure 10.7 below.

**Figure 10.7: Conceptual view of new constructed stream channel**

**Residual impacts of the proposed development**

The residual impacts associated with the proposed development will comprise the loss of semi-improved grassland and recolonising grassland mosaic habitat to the proposed development footprint.

The loss of these habitats has been assessed as being of minor negative significance. The provision of meadow grassland habitats that will be managed throughout the operation phase of the proposed development for biodiversity will further offset the loss of these habitats such that the residual impact is assessed as being representative of an effect of negligible significance.

There will be a minor loss of bat foraging habitat relied upon by Leisler's bat and Common pipistrelle. The retention of woodland habitat to the north of the project site and the maintenance of habitat corridors connecting lands to the west and east of the landholding via woodland to the north will ensure that foraging habitat and connectivity in the landscape continues to be provided for bat species. Furthermore the enhancement of woodland habitat with native tree species that are known to support higher abundance and diversity of invertebrates than existing Ulex europeaus and Prunus spinosa dominated scrub habitat will enhance foraging conditions for bat within the landholding.

There will be a loss of potentially suitable foraging habitat for yellowhammer to the footprint of the proposed development. This loss has been assessed as an effect of minor negative significance. This effect will be further minimised by the provision of compensatory foraging habitat within areas of open long sward meadow to the north of the proposed development footprint.

## 10.5 Cumulative impacts

The potential exists for the proposed development to overlap with other construction projects within the vicinity of the project site. Other projects include the planning application reference no. 184633 within the IDA lands to the south of the project site. This project sought the retention of existing lamp standards in the carpark of the Flextronics facility. This is a small-scale retention planning application that provided for the retention of

lighting in this area that is subject to existing night time lighting. The proposed development will also result in the provision of night time lighting but this will be designed in accordance with best practice design guidelines and will avoid high value bat foraging habitats that will be retained within the lesser horseshoe bats and the surrounding area. Given the extent of suitable foraging habitat for bats in the surrounding area, as shown on Figure 10.4 above, along with the sensitive design of the proposed development there will be no potential for the proposed development to combine with this project to result in significant negative impacts to bats and other nocturnal species.

Planning permission was granted to Cork City Council under a Part 8 Planning Application for the carrying out of enabling infrastructural work at their landbank on the Old Whitechurch Road. The enabling infrastructural works have commenced at the time of writing and include the following:

The under-grounding of overhead power and communications lines, which will require the removal of metal masts and wooden poles, and the erection of new 'line cable interface' masts:

- the creation of a new junction and improvements on the Old Whitechurch Rd and Old Mallow Rd;
- the provision of a spine access/trunk road including ducting for electricity, gas, Eir and Virgin Media;
- the provision of water, foul and surface water drainage services for Irish Water and the council;
- and connecting existing services to the site including works in the adjacent Kilbarry 110KB sub-station to facilitate the under-grounding of overhead cables.

Given that these enabling infrastructural works are currently underway it is considered highly unlikely that they will overlap with the construction phase of the current proposed project. Nevertheless in the event that the enabling works or other future construction works for the development of these Council lands overlap with the proposed project there will be potential, in the absence of appropriate safeguards, for cumulative negative impacts to the water quality of the Glenamought River and the River Bride with downstream impacts to water quality. However a range of mitigation measures have been outlined in this Chapter and Chapter 14 Hydrology of this EIAR and with the implementation of these measures to protect water quality in surrounding receiving waterbodies, there will be no potential for the proposed development to combine with this project to result in significant negative impacts to water quality and associated aquatic receptors. The current proposed development has been designed to retain key habitat and habitat for key species and thereby will ensure that significant cumulative effects to such receptors with this Cork City Council project are avoided.

In general terms the phasing/commencement of any other permitted developments in the locality could potentially result in the scenario where a number of other construction sites are in operation at the same time as the proposed development. The location of any other nearby construction sites in relation to each other and to nearby biodiversity receptors including fauna such as birds and mammals and freshwater habitats supported by the Glenamought River and River Bride downstream, will have the potential to combine to result in a cumulative risk of impacts due to, for instance, cumulative loading of noise disturbance to fauna or sediment and wet concrete in surface water runoff to these watercourses. There is a general low risk of cumulative impacts resulting in significant negative noise disturbance effects to fauna in the area. The potential for cumulative impacts to the Glenamought River and the River Bride downstream and the freshwater habitats and species supported by it have been examined as part of the Natura Impact Statement for the proposed development and it has been found that provided all relevant mitigation measures for the construction phase are implemented there will be no potential for the proposed development to combine with other projects in the surrounding area to result in

significant negative cumulative impacts to the Rive Lee surface water catchment, including the Glenamought River and River Bride downstream.

The operation phase of the project will not have the potential to result in significant noise emissions and as such there will be no potential for this phase of the development to result in cumulative negative impacts to biodiversity receptors as a result of noise emissions.

The lighting design for the project has been prepared to ensure that light spill in sensitive locations to the north of the project site within woodland and meadow grassland habitats retained for biodiversity is avoided. In light of this the project will not have the potential to combine with other projects to result in cumulative light pollution in these areas to the north of the project site.

The surface water management design for the project will ensure that the project will not have the potential to result in the discharge of contaminated surface water to the Glenamought River and this will eliminate the potential for the project to combine with other sources of surface water pollution to the River Blackwater.

### 10.6 Interactions

Biodiversity interactions are primarily linked to interactions with hydrology. Chapter 14 of this EIAR provides an assessment of potential impacts to hydrology and receiving waterbodies. A series of mitigation measures are proposed in this Chapter and Chapter 14 that aim to ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) is of an appropriate standard.

### 10.7 Difficulties in compiling information

No difficulties were encountered during the preparation of this chapter of the EIAR.

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## 11.0 ARCHAEOLOGY AND CULTURAL HERITAGE

**Contents**



**Figures, Plates and Tables**

## 11.1 Introduction

### 11.1.1 Chapter Authors

This Chapter has been prepared by John Cronin and David Murphy of John Cronin & Associates. Mr. Cronin holds qualifications in archaeology (BA (University College Cork (UCC), 1991), regional and urban planning (MRUP (University College Dublin (UCD) 1993) and post-graduate qualifications in urban and building conservation (MUBC (UCD), 1999) and Mr. Murphy holds a BA degree in archaeology (UCC 2003). Both of these individuals have extensive experience in preparing archaeological, architectural, and cultural heritage assessments for residential projects.

### 11.1.2 Chapter Context

This section of the EIAR describes the impacts of the proposed development on the known and potential cultural heritage resource concerning the integrity, continuity, and context of same for future generations. UNESCO define the term 'Cultural Heritage' as encompassing several aspects of tangible assets (immovable: archaeological sites and monuments, architectural heritage structures; movable: artefacts; and underwater: shipwrecks, submerged features) and intangible assets (e.g., folklore, oral tradition, and language).

### 11.1.3 Methodology

**Guidance**

This section of the EIAR is prepared in accordance with the following guidelines: The guidelines relevant to the Cultural Heritage section of the EIAR include the *Architectural Heritage Protection: Guidelines for Planning Authorities* (Department of Arts, Heritage, and Gaeltacht 2011) and the *Framework and Principles for the Protection of Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht and the Islands 1999). The assessment was also informed by the Environmental Protection Agency (EPA 2022) Guidelines for Information to be Contained in EIAR and the International Council on Monuments and Sites (ICOMOS 2011) *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*.

**Assessment Methodology**

The methodology used for this assessment is in accordance with Environmental Protection Agency (EPA 2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements and EPA (2002) Guidelines on the Information to be contained in Environmental Impact Statements; as well as more recent (draft) guidance methods have also been utilised per EPA (2015) Draft Advice Notes for Preparing an EIS and (2022) Guidelines for Information to be Contained in EIAR. The chapter complies with the requirements of Directive 2011/92/EU as amended by Directive 2014/52/EU, the Planning and Development Act, 2000 (as amended) and the Planning and Development Regulations, 2001 (as amended).

The assessment was based on a programme of desk-based research combined with a field-walking inspection of the proposed site and these studies were undertaken to identify any features of archaeological, architectural or cultural heritage significance likely to be impacted by the proposed development. The study area reviewed for the assessment of the lands within the proposed development site. The study area also included the surrounding lands extending for 1km in all directions from the site boundary which were also reviewed in order to compile a baseline cultural heritage context for the area.

**Sources of information**

The assessment presents the results of a desktop study of relevant published sources and datasets undertaken in order to identify all recorded and potential archaeological, architectural, and other cultural heritage sites/features/areas within the study area. The principal sources reviewed for the assessment of the recorded archaeological resource were the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP). The Record of Protected Structures (RPS) and the National Inventory of Architectural Heritage (NIAH) were consulted for assessing the designated architectural heritage resource. Details on the legal and planning frameworks designed to protect these elements of the cultural heritage resource are also provided. Other sources consulted as part of the assessment included the following:

*Development Plans:* The Cork City Development Plan 2015-2021, the Cork City Development Plan 2022-2028 and the Cork County Development Plan 2014 were consulted as part of this assessment. These publications identify the buildings listed in Records of Protected Structures and also outline the Councils' policies and objectives for the protection of the archaeological, architectural, and cultural heritage resource within its administrative area.

*Archaeological Inventory of County Cork Volume 2: East and South Cork*: This publication present summary descriptions of the recorded archaeological sites within this area of the county and the relevant entries are included within the chapter. In addition, the current national online database resources pertaining to same were reviewed on the National Monuments Service's Historical Environment Viewer (www.archaeology.ie) in April 2022.

*Heritage Council of Ireland: Heritage Map Viewer*: This online mapping source (www.heritagemaps.ie) collates various cultural heritage datasets provided by, among others, the National Monuments Service, the National Museum of Ireland, local authorities, the Royal Academy of Ireland and the Office of Public Works. Relevant datasets were reviewed in June 2022.

*Database of Irish Excavation Reports*: This database contains summary accounts of all archaeological excavations carried out in Ireland (North and South) from 1969 to present. Current data was accessed via www.excavations.ie in June 2022.

*Literary Sources:* Various published sources were consulted in order to assess the archaeological, historical, architectural heritage and folklore record of the study area and these are listed in Section 11.8 of this chapter.

*Historic Maps:* A review of available historic cartographic sources was undertaken, and these included the 17th-century Down Survey and various map editions published by the Ordnance Survey from the mid-19th century onward. These sources can indicate the presence of past settlement patterns, including features of archaeological and architectural heritage significance that no longer have any surface expression. Extracts from the reviewed maps are presented in 11.2.3.2.

*Aerial and Satellite imagery*: A review of available imagery of the study area was undertaken in order to review the extent of modern interventions and to ascertain if any traces of undesignated cultural heritage features, including sub-surface archaeological sites, were visible.

*Irish National Folklore Collection*: Transcribed material from the National Folklore Collection archive has been digitised and published online at www.duchas.ie. This online archive was reviewed in June 2022. The database contained no entries in relation to the townland of Kilbarry within the barony of Cork.

*UNESCO designated World Heritage Sites and Tentative List*: There are two designated World Heritage sites in Ireland and a number of other significant examples have been included in a Tentative List (2010) that has been put forward by Ireland for inclusion. None of these designated or tentative sites are located within 20km of the proposed residential development site.

**Field Survey**

A suitably qualified archaeologist (David Murphy) carried out an inspection of the proposed development site on Thursday 12th May 2022. The site was assessed in terms of historic landscape, land use, vegetation cover, presence and potential for undetected archaeological and architectural heritage sites/features. Weather conditions were dry and bright at the time of survey and this provided excellent landscape visibility. The results of the site inspection are detailed in Section 11.2.3.5 and extracts from the photographic record are presented in Appendix 11.1.

**Assessment of Impacts**

The methodology used for the assessment of potential impacts has been informed by the Environmental Protection Agency (EPA) *Guidelines for Information to be Contained in EIAR* (2022), in accordance EIA requirements of codified EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended). The following summation of the criteria used to assess impacts is provided in order to concisely outline the methodology specifically applied to the cultural heritage resource. Assessment is achieved by a consideration of the duration, quality, type, value and magnitude of effect(s) on the cultural heritage resource:

Duration of Effect is assessed based on the following criteria:

- Momentary (seconds to minutes)
- Brief < 1 day
- Temporary <1 year
- Short-term 1-7 years
- Medium Term 7-15 years
- Long Term 15-60 years
- Permanent > 60 years
- Reversible: Effects that can be undone, for example through remediation or restoration

Quality of Effect on the cultural heritage resource can be positive, neutral or negative:

- Positive: a change which improves the quality of the cultural heritage environment (e.g. increasing amenity value of a site in terms of managed access, signage, presentation etc. or high-quality conservation and re-use of an otherwise vulnerable derelict structure).
- Neutral: no change or effects that are imperceptible, within the normal bounds of variation for the cultural heritage environment.

- Negative: a change which reduces the quality of the cultural heritage resource (e.g. visual intrusion on the setting of an asset, physical intrusion on features/setting of a site).

Type of Effect on the cultural heritage resource can be direct, indirect or no predicted impact:

- Direct impact: where a cultural heritage site is physically located within the footprint of the proposed development, which will result in its complete or partial removal.
- Indirect impact: where a cultural heritage site or its setting is located in close proximity to the footprint of the proposed development.
- No predicted impact: where the proposed development will not adversely or positively affect a cultural heritage site.

The Magnitude of Effect is based on the degree of change, incorporating any mitigation measures, and is based on a consideration of the character, duration, probability and consequences (Table 11.1). The magnitude can be negative or positive and is ranked without regard to the value of the asset according to the following scale: High; Medium; Low and Negligible. The descriptions of magnitudes presented in Table 11.1 is based on guidance published in *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011, 16-7).

| Magnitude | Description |
|---|---|
| High | Most or all key archaeological or architectural materials affected such that the resource is totally altered<br>Comprehensive changes to setting<br>Changes to most or all key historic landscape elements, parcels or components; extreme visual effects; fundamental changes to use or access; resulting in total change to historic landscape character unit<br>Major changes to area that affect Intangible Cultural Heritage activities or associations or visual links and cultural appreciation |
| Medium | Changes to many key archaeological or historic building materials/elements such that the resource is clearly/significantly modified.<br>Considerable changes to setting that affect the character of the archaeological asset.<br>Changes to the setting of a historic building, such that it is significantly modified.<br>Change to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, considerable changes to use or access, resulting in moderate changes to historic landscape character.<br>Considerable changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation. |
| Low | Changes to key archaeological materials/historic building elements, such that the resource is slightly altered/slightly different.<br>Slight changes to setting of an archaeological monument.<br>Change to setting of a historic building, such that it is noticeably changed.<br>Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; slight changes to use or access; resulting in limited change to historic landscape character. |

| Magnitude | Description |
|---|---|
| | Changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation. |
| Negligible | Very minor changes to key archaeological materials or setting.<br>Slight changes to historic building elements or setting that hardly affect it.<br>Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes to use or access; resulting in very small change to historic landscape character.<br>Very minor changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation. |

**Table 11.8: Magnitudes of Effect on Cultural Heritage Assets.**

Values assigned to cultural heritage assets for the purposes of this assessment are intended as indicators which contribute to a wider judgment based on the individual circumstances of each asset. Other than the level of legal designations, e.g., National Monuments and recognition as World Heritage sites, there is no formal grading or rating system for Irish archaeological monuments or architectural heritage structures. The non-statutory National Inventory of Architectural Heritage (NIAH) does apply a ranking system (Local, Regional, National and International) to structures included in that inventory and, while these rankings do not confer a graduated level of statutory protection they have been utilised as a value indicator for NIAH-listed structures for the purpose of this assessment.

The criteria for assessing the value of archaeological and other cultural heritage assets as part of this assessment has been informed by the *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011, 14-16). The Value of known or potential cultural heritage assets are ranked according to the following scale: Very High, High; Medium; Low and Negligible (Table 11.2). Generally, the more criteria that are evident for a given asset, the higher in scale its respective Value is deemed to be. Criteria considered in addition to legal designations include condition / preservation; documentary / historical significance; group value; rarity; visibility in the landscape; fragility / vulnerability and amenity value. The values assigned to identified assets within the study area were determined following the completion of the desktop study combined with site inspections and are identified in Section 11.2 of this chapter.

| Value | Example of Asset Types |
|---|---|
| Very High (International Significance) | World Heritage Sites (including Tentative List properties)<br>Sites, buildings or landscapes of acknowledged international importance<br>Intangible associations with individuals or innovations of global significance |
| High (National Significance) | Nationally designated sites, buildings and landscapes of significant quality, rarity, preservation and importance<br>Undesignated assets of the quality and importance to be designated<br>Assets that can contribute significantly to acknowledged national research objectives<br>Archaeological Landscapes with significant group value<br>Intangible associations with individuals or innovations of national significance |

| Value | Example of Asset Types |
|---|---|
| Medium (Regional Significance) | Designated or undesignated assets that can contribute significantly to regional research objectives, including buildings that can be shown to have exceptional qualities in their fabric or historical associations<br>Conservation Areas and historic townscapes containing buildings that contribute significantly to its historic character<br>Intangible associations with individuals or innovations of regional significance |
| Low (Local Significance) | Assets compromised by poor preservation and/or poor survival of contextual associations<br>Assets of limited value, but with potential to contribute to local research objectives<br>Historic Townscape or built-up areas of limited historic integrity in their buildings and settings<br>Intangible associations with individuals or innovations of local significance |
| Negligible | Assets with very little or no surviving archaeological interest<br>Landscapes little or no significant historical interest<br>Buildings or urban areas of no architectural or historical note; buildings of an intrusive character |
| Unknown Potential | Assets whose importance has not been ascertained<br>Buildings with some hidden (i.e., inaccessible) potential for historic significance |

**Table 11.9: Factors applied for assessing the Value of Cultural Heritage Assets**

The significance of effect can be described as Profound, Very Significant, Significant, Moderate, Slight, Not Significant or Imperceptible (Table 11.10) and is assigned based on the combined evaluation of effect magnitude and asset values (Table 11.11).

| Significance | Description |
|---|---|
| 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. |

**Table 11.10: Significance of Effects (per EPA EIAR Guidelines 2022)**

| | | | | | |
|---|---|---|---|---|---|
| ***Magnitude of Impact*** | **High** | Not Significant/ Slight | Moderate/ Significant | Significant/ Very Significant | Very Significant/ Profound |
| | **Medium** | Not Significant | Slight | Moderate/ Significant | Significant/ Very significant |
| | **Low** | Not Significant/ Imperceptible | Slight/ Not Significant | Slight | Moderate |
| | **Negligible** | Imperceptible | Not Significant/ Imperceptible | Not Significant/ Slight | Slight |
| | | **Negligible** | **Low** | **Medium** | **High/Very High** |
| | | ***Value/Sensitivity of the Asset*** | | | |

**Table 11.11: Significance of Effects Matrix (after EPA EIAR Guidelines 2022)**

## 11.2 Description of Baseline/ Existing Environment

### 11.2.1 Introduction

The proposed site is located in the townland of Kilbarry which is on the northern outskirts of Cork City. The lands within the site comprise open fields under grass, scrub, and gorse with established boundaries. An old hurling manufacturing factory lies derelict at the western side. The lands are bounded to the north by the Glenamought River and Valley. Here, the lands slope steeply down to north towards the river and informal walking paths are evident. To the east, the lands are bounded by the Delaney's GAA grounds. Along the southern margin of the site, a roadway runs between the GAA club and the Old Whitechurch Road. Further to the south, and to the southeast beyond the GAA grounds, lie IDA employment lands within the Kilbarry Business and Technology Park. Cork City Council's Whitechurch LIHAF development lands are to the immediate southwest of the site. The undisturbed soil profiles for the area comprise fine loamy drift with siliceous stones.


**Figure 11.8: Map depicting the location and extent of the proposed development (red outline).**

### 11.2.2 Legal and Planning Context

The management and protection of cultural heritage in Ireland is achieved through a framework of national laws and policies which are in accordance with the provisions of the Valetta Treaty (1995) (formally the European Convention on the Protection of the Archaeological Heritage, 1992) ratified by Ireland in 1997; the European Convention on the Protection of Architectural Heritage (Granada Convention, 1985), ratified by Ireland in 1997; and the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003, ratified by Ireland in 2015. The locations of World Heritage Sites (Ireland) and the Tentative List of World Heritage Sites submitted by the Irish State to UNESCO were reviewed and none are located within the region of the country which contains the study area.

The national legal statutes and guidelines relevant to this assessment include:

- National Monuments Acts 1930 (as amended)
- Heritage Act 1995 (as amended)
- National Cultural Institutions Act 1997
- The Architectural Heritage (National Inventory) and Historic Monuments (Misc) Provisions Act 1999
- Planning and Development Act 2000, as amended
- Department of Arts, Heritage and Gaeltacht 2011 *Architectural Heritage Protection: Guidelines for Planning Authorities*.
- Department of Arts, Heritage, Gaeltacht and the Islands 1999 *Framework and Principles for the Protection of Archaeological Heritage*.

*Relevant Archaeological Legislation and Planning Policies*

The administration of national policy in relation to archaeological heritage management is the responsibility of the National Monuments Service (NMS) which is currently based in the Department of Housing, Local Government and Heritage. The National Monuments Act of 1930, and its Amendments, are the primary means of ensuring the satisfactory protection of the archaeological resource. They include a number of provisions that are applied to secure the protection of archaeological monuments. These include the designations of nationally significant sites as National Monuments, the Register of Historic Monuments (RHM), the Record of Monuments and Places (RMP), the Sites and Monuments Record (SMR), and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites. Section 2 of the National Monuments Act, 1930 defines a National Monument as 'a monument or the remains of a monument, the preservation of which is a matter of national importance'. The State may acquire or assume guardianship of examples through agreement with landowners or under compulsory orders while monuments within the ownership of local authorities are also deemed to be National Monuments. There are no National Monuments located within the study area. The nearest National Monument to the proposed development site is Barryscourt Castle (CO075-018001-) (Nat. Mon. 641) which is located circa 15km to the southeast of the proposed development.

The National Monuments (Amendment) Act, 1994 made provision for the establishment of the RMP, which comprises the known archaeological sites within the State. The RMP, which is based on the earlier Register of Historic Monuments (RHM) and Sites and Monuments Record (SMR), provides county-based lists of all recorded archaeological sites with accompanying maps. All RMP sites receive statutory protection under the National Monuments Act 1994 and the NMS must be given two months' notice in advance of any work

proposed at their locations. There are no recorded archaeological sites (as recorded by the Archaeological Survey of Ireland (ASI)) located within the boundary of the proposed development site, while there are 14 recorded sites located within the surrounding 1km area, the nearest of which (CO063-067----; Mill - corn) is located c. 25m outside the northern boundary of the proposed development. These archaeological sites are listed in Table 11.5 and mapped in Figure 11.2 below.

The Cork City Council Development Plan 2015-2021 includes various objectives intended to protect the architectural heritage resource within the city and these include the following relevant examples:

- Objective 9.4 Archaeological Heritage: Cork City Council will aim to protect, record, and promote the rich archaeological heritage of the city.
- Objective 9.5 Sites of Established Archaeological Interest: Cork City Council will protect and enhance the archaeological value of the sites (and their settings) listed in the Record of Monuments and Places (RMP).
- Objective 9.6 Newly Discovered Sites: Cork City Council will protect and preserve archaeological sites discovered since the publication of the Record of Monuments and Places (RMP).
- Objective 9.7 Preservation of archaeological remains in-situ: In accordance with national policy (and in the interests of sustainability) impacts on the buried archaeological environment should be avoided where possible.
- Objective 9.15 Surveys, Test Trenching and Monitoring: Archaeological surveys, test excavation and /or monitoring will be required for development proposals in areas of archaeological importance, if the application is likely to impact upon in-situ archaeological structures or deposits
- Objective 9.16 Large-scale Development (outside the boundaries of a RMP): Outside the Zone of Archaeological Potential of a RMP, where in the opinion of the City Council a development involves major ground disturbance; archaeological conditions may be applied particularly in the vicinity of known monument

In addition, the Cork City Development Plan 2022-2028 also outlines a range of objectives in relation to the future protection of the archaeological resource (Objectives 8.1 to 8.10 inclusive) which cover a similar range of objectives as those included in the Cork City Development Plan 2015-2021. Note this 2022 Plan has not yet been published.

*Relevant Architectural Heritage Legislation and Planning Policies*

Protection of architectural heritage is provided for through a range of legal instruments that include the Heritage Act 1995, the Architectural Heritage (National Inventory) and National Monuments (Misc. Provisions) Act 1999, and the Planning and Development Act 2000. Section 2(1) of the Heritage Act 1995, defines architectural heritage as including:

> *"All structures, buildings, traditional and designed, and groups of buildings including streetscapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest, together with their setting, attendant grounds, fixtures, fittings and contents, and, without prejudice to the generality of the foregoing, includes railways and related buildings and structures and any place comprising the remains or traces of any such railway, building or structure."*

The Planning and Development Act 2000 requires Planning Authorities to keep a 'Record of Protected Structures' (RPS) of buildings and other structures that are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. All structures listed for protection in current Development Plans, have become Protected Structures and planning permission is required for any works to such structures that would affect their character. A protected structure also includes the land and other structures within its curtilage. While the notion of curtilage is not defined by legislation, the Architectural Heritage Protection Guidelines for Local Authorities (Department of Arts, Heritage and the Gaeltacht 2011), describes it as the parcel of land immediately associated with a structure and which is (or was) in use for the purposes of the structure. The Planning and Development Act 2000 also provides for the inclusion of objectives for preserving the character of places, areas, groups of structures or townscapes of special interest designated as Architectural Conservation Areas (ACAs). There are no Protected Structures within the proposed development site while three examples are located within the surrounding 1km study area (Table 11.7).

The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 established the National Inventory of Architectural Heritage (NIAH), including the NIAH Historic Gardens and Designed Landscapes, to create a record of built heritage structures and associated lands within the State. While inclusion in a NIAH inventory does not provide statutory protection to a structure, the inventory is used to advise local authorities on compilation of their Records of Protected Structures. There are no NIAH listed structures within the site of the proposed development while there are eight examples within the surrounding 1km study area (Table 11.7). Three of these eight sites are also included in the Record of Protected Structures within the Cork City Development Plan 2022-2028.

The Cork City Council Development Plan 2015-2021 includes various objectives intended to protect the architectural heritage resource within the city and these include the following relevant examples:

- Objective 9.23 Record of Protected Structures (RPS): Cork City Council will maintain a Record of Protected Structures within the Cork City Development Plan, which shall include structures or parts of structures which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, and which it is an objective to protect.
- Objective 9.25 Recording of Protected Structures: Any alteration or demolition of a Protected Structure shall require a full record to Best Conservation Practice.
- Objective 9.26 Historic Landscapes: Cork City Council will ensure the historic landscapes and gardens throughout the city are protected from inappropriate development.
- Objective 9.28 Protection of NIAH and other structures of built heritage interest: The City Council as planning authority aims to protect structures of built heritage interest. The "Ministerial Recommendations", made under Section 53 of the Planning Acts, asking the City Council to protect structures will be taken into account when the City Council as planning authority is considering proposals for development that would affect the historic interest of these structures of significance. The City Council will protect structures by making additions to the Record of Protected Structures, designating Architectural Conservation Areas, or other appropriate means.
- Objective 9.29 Architectural Conservation Areas: To seek to preserve and enhance the designated Architectural Conservation Areas in the City.
- Objective 9.34 Individual buildings of character in suburban areas/ villages: There will be a presumption against the demolition of buildings of Historic or Vernacular character in suburban areas/villages.

- Objective 9.35 Elements of the Built Heritage: To ensure the protection of important elements of the built heritage and their settings as appropriate.

In addition, the Cork City Development Plan 2022-2028 also outlines a range of objectives in relation to the future protection of the architectural heritage resource (Objectives 8.17 to 8.30 inclusive) which are similar in range to those included in the Cork City Development Plan 2015-2021. Note this 2022 Plan has not yet been published.

### 11.2.3 Desktop Study

**Archaeological Heritage**

The following section presents summary details of the main periods within the Irish archaeological record with references to the recorded archaeological sites located within the study area. Relevant datasets have been interrogated and retrieved from current state and local authority sources and are considered accurate at the time of writing in April 2022. The dating framework used for each period is based on the National Monument Service's Guidelines for Authors of Reports on Archaeological Excavations as published by the National Monuments Service (2006).

The Archaeological Survey of Ireland (ASI) records no known archaeological sites within the boundary of the proposed development site. The ASI records 14 archaeological sites within 1km of the proposed development footprint. The nearest of these is a corn mill (CO063-067----) which is located c.25m to the north of the proposed development boundary (Table 11.5 and Figure 11.1). None of the archaeological sites within the study area are designated as National Monuments in State Care or have been assigned Preservation Orders.

| SMR No. | Class | Townland | ITM E, N | Distance from development |
|---|---|---|---|---|
| CO063-066---- | Standing stone | Kilcully | 567227, 575811 | 325m to NW |
| CO063-065001- | Graveyard | Kilcully | 567130, 576366 | 960m to N |
| CO063-065002- | Church | Kilcully | 567132, 576369 | 960m to N |
| CO063-067---- | Mill – corn | Kilbarry | 567235, 575360 | 25m to N |
| CO063-068001- | Mill – corn | Kilcully | 568035, 575935 | 640m to N |
| CO063-068002- | Mill - unclassified | Kilcully | 568114, 575967 | 750m to NE |
| CO063-068003- | Mill - unclassified | Kilcully | 568186, 576005 | 850m to NE |
| CO063-070---- | Standing stone | Ballincrokig | 568364, 575516 | 709m to NE |
| CO063-071---- | Standing stone | Ballincrokig | 568409, 575613 | 770m to NE |
| CO063-072---- | Standing stone | Ballincrokig | 568594, 575769 | 840m to NE |
| CO063-111---- | Standing stone | Carhoo | 566521, 575478 | 575m to W |
| CO074-018---- | Ritual site - holy well | Kilbarry | 567321, 574730 | 285m to S |
| CO074-112---- | Mill – corn | Kilnap | 566437, 575022 | 605m to SW |
| CO074-115---- | Mill – flax | Kilnap | 567326, 574182 | 775m to S |

**Table 11.12: Recorded archaeological sites located within 1km of the proposed development.**

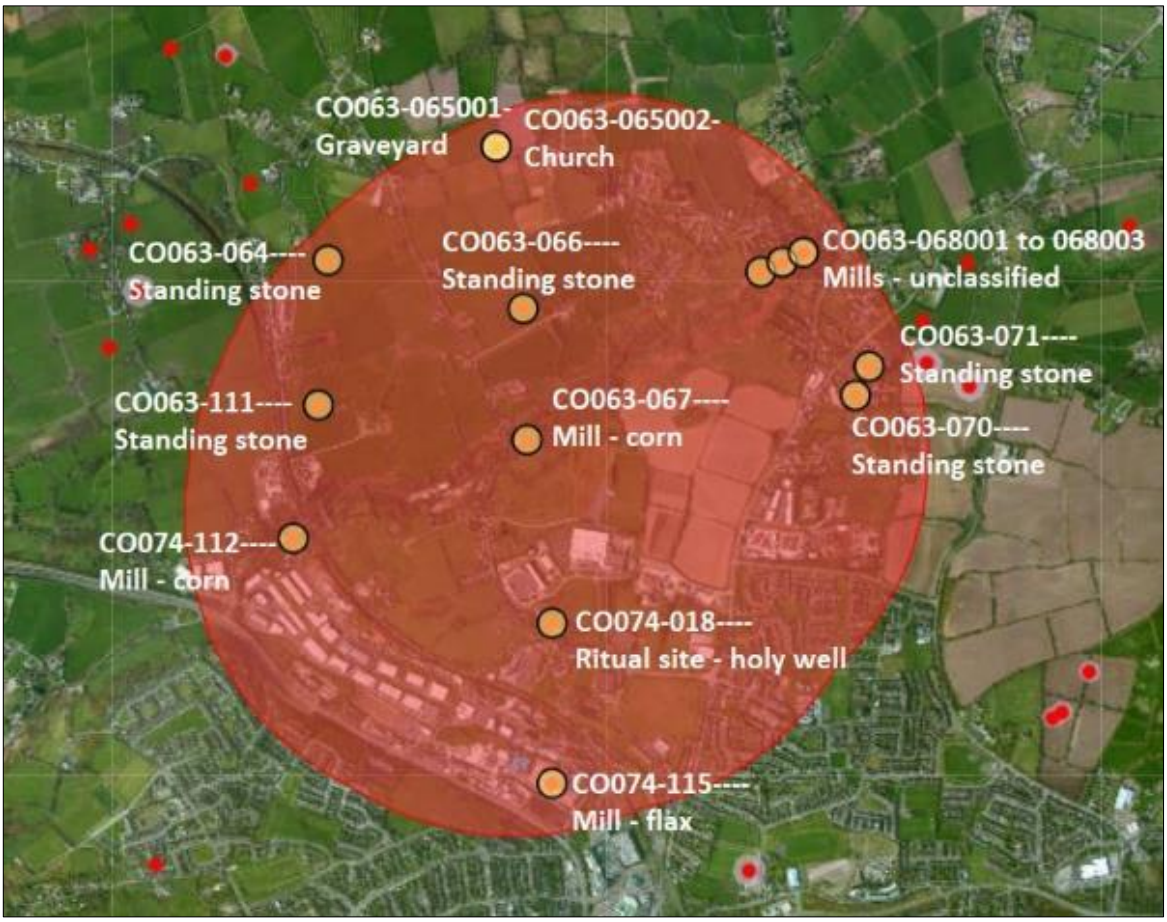


**Figure 11.9: Recorded archaeological sites within the 1km study area.**

***Prehistoric Periods***

Until the recent identification of Palaeolithic human butchery marks on a animal bones recovered from cave sites in Counties Clare and Cork, the earliest recorded evidence for human activity in Ireland dated to the Mesolithic period (7000–4000 BC) when groups of hunter-gatherers arrived on the island. The archaeological record indicates that these mobile groups favoured coastal, lake and river shores which would have provided food and water resources and also likely formed transport routes through the heavily wooded island. While the Mesolithic communities did not construct settlements or monuments that have left any above ground traces, their presence can often be identified by scatters of worked flint in ploughed fields. The Neolithic period (c.4000-2400 BC) began with the arrival and establishment of agriculture as the principal form of economic subsistence, which resulted in more permanent settlement patterns. As a consequence of the more settled nature of agrarian life, new site-types, such as more substantial rectangular timber houses and various types of megalithic tombs, begin to appear in the archaeological record during this period. The Irish Bronze Age (c.2400–500 BC) commenced with the arrival of metal-working techniques to the island and this technological advance resulted in the introduction of a new artefactual assemblage into the Irish archaeological record. This period was also associated with the construction of new monument types such as standing stones, stone rows, stone circles, barrows and fulachta fia. The arrival of iron-working technology in Ireland saw the advent of the Iron Age (600 BC – 400 AD). This period has been traditionally associated with a Celtic 'invasion' but this view is no longer widely accepted as recent archaeological evidence points instead to a gradual acculturation of the Irish Bronze Age communities following centuries of contacts with Celtic-type cultures in Europe. Relatively little has been traditionally known about Iron Age settlement and ritual practices until recent decades when the corpus

of evidence has been greatly increased by the discovery of sub-surface remains of Iron Age sites during modern development projects. Five standing stones which are located within the study likely date to the Bronze of Iron Age period. These monuments are described as follows by the ASI:

*Standing stone CO063-064----*
*In pasture, on W-facing slope. No visible surface trace.*

*Standing stone CO063-066----*
*In pasture on S-facing slope. Rectangular stone (H 1.7m; 0.4m x 0.25m), long axis NW-SE, leaning heavily to E.*

*Standing stone CO063-070----*
*In pasture, on S-facing slope. No visible surface trace. Similar stone (CO063-071---) indicated on 1842 OS 6-inch map, in field to N.*

*Standing stone CO063-070----*
*In pasture. No visible surface trace. Similar stone (CO063-070---) indicated on 1842 OS 6-inch map in field to S.*

*Standing stone CO063-070----*
*In pasture, on a break in a SE-facing slope, just below the crest of a hill and commanding extensive views across the valley to Cork City. This standing stone (0.7m x 0.2m; H 1.65m) leans slightly to the N and is orientated N-S. There ground around the base of the stone is largely denuded and eroded by cattle. The top of a small slab (0.3m x 0.03m; H 0.08m) protrudes above the ground c. 0.8m to the W of the S end of the standing stone.*

***Medieval periods***

The early medieval period began with the introduction of Christianity and continued up to the arrival of the Anglo-Normans in the late 12th century (c.400–1169 AD). While the medieval period saw the emergence of the first phases of urbanisation around the larger monasteries and the Hiberno-Norse ports, the dominant settlement pattern was still rural-based and centred around enclosed farmsteads known as ringforts (earth/timber built) and cashels (stone built). Ringforts are one of the most numerous monuments in the Irish landscape, with some 45,000 recorded examples (Stout 1997, 53). These sites comprise broadly circular enclosures delimited by one or more concentric banks and ditches in the case of ringforts and drystone walls in the case of cashels. They were formerly known by the names ráth/lios/cathair/dún, which still form some of the most common place-name elements within the Irish landscape. The majority of excavated examples have produced evidence for the remains of timber houses, outbuildings and stockades as well as a variety of agricultural and craft activities such as grain processing and metalworking. There are no ringforts within the study area. The nearest ringfort to the proposed development site is situated in Ballincrokig c. 1.1km to the east.

The arrival of the Anglo-Normans in the late 12th century broadly marks the advent of the Irish high medieval period which continued to c.1400 and was followed by the late medieval period which extended to c.1550. These periods saw the continuing expansion of Irish urbanisation as many of the port cities developed into international trading centres and numerous villages and towns began to develop throughout the country, often

within the environs of Anglo-Norman manorial centres which were defended by masonry castles. The descendants of the Anglo-Norman gentry began the widespread construction of tower-houses as fortified residences within their landholdings at the start of the 15th century and this trend was subsequently adopted by wealthy Irish families within areas under Gaelic control. The proposed development site is located c. 2.4km to the northwest of the medieval walled city of Cork and likely formed part of the settlement's agricultural hinterland during the high and late medieval periods. The remains of a church site (CO074-010002-) and its associated graveyard (CO074-010001-) in Kilcully townland may both date to at least the late medieval period and the following are excerpts from their Archaeological Survey of Ireland inventory entries:

> *Church CO063-065002-*
> *Just N of centre in graveyard (CO063-06501-), ruins of rectangular church (18.9m E-W; 7.5m N-S). S wall almost entirely fallen; W and N walls stand to max. H 1.5m, ivy-clad; E gable stands to near full height, also ivy-clad. Central window in E wall, embrasure splayed with segmental arch; double ogee-headed light, mullion missing. E gable shows signs of recent repair and repointing. Recent grave on line of S wall, probably in doorway position. Gravemarkers dating back to 1780s in interior, tree growing near W end. Remains of late medieval parish church of Kilcully, in repair 1615 but ruinous by 1639 (Brady 1863, vol. 1, 146).*
>
> *Graveyard CO063-065001-*
> *On N side of road; roughly rectangular graveyard enclosed by stone-faced earthen bank, roadside to S. Ruins of parish church of Kilcully (CO063-06502-) to N of centre. Headstones date from 1772, early in this century 'many of the graves marked by decayed wooden crosses' (Coleman 1913-16d); still in use.*

***Post-Medieval and Early Modern Periods***

The centuries following 1550 comprise the post-medieval period which continued into the middle of the 19th century and the period thereafter is often described as early modern. The first century of the post-medieval period was a turbulent time in Ireland history and saw a prolonged period of wars between the 1560s and 1603 with further conflicts arising during the Cromwellian Wars (1649–53) which resulted in the extensive dispossession of Irish lands. The post-medieval period saw the development of high and low status stone houses throughout the Irish countryside and rural settlement clusters at this time typically consisted of single-storey thatched cottages with associated farm buildings while two-storey farmhouses became more common as the 19th century progressed. An agricultural boom in the late 18th and early 19th centuries saw a rise in prices for both tillage and dairy produce and resulted in Irish landlords investing in extensive land improvement works within their holdings. This included widespread land drainage works, introduction of soil nutrients, grass planting and the enclosure of open lands into field systems that survive to the present-day. The popularity and success of potato farming contributed to a population boom during the 18th and early 19th centuries and its failure in the middle of the latter century was to have devasting consequences. The settlement pattern throughout much of the rural landscape was greatly affected by the Famine period and its aftermath which saw the depopulation of many areas. The following decades were marked by an increasing move away from small-scale subsistence farming towards more market-led agriculture, assisted by the development of the Co-Op system, which resulted in extensive programmes of land improvement works throughout the country.

The Down Survey was compiled during the middle of the 17th century as part of the Cromwellian Plantation and records that the townland of Kilbarry formed part of the landholdings of a Catholic by the name of Donogh O'Mehigan in 1641, while they were in the ownership of a Protestant named Walter Galway in 1671. Galway

may have been leasing the land from the Countess of Barrimore as it is she who is indicated to control the lands on the Down Survey barony maps.

As detailed further in the below Cartographic Review (Section 13.2.3.4), while the suburbs around the medieval core of the city began to rapidly expand in all directions during the 19th and 20th centuries, the location of the proposed development site and its environs remained as agricultural land until the later decades of the latter century which saw the construction of the extensive commercial and residential developments in the area to the south and east, with areas of farmland surviving to the north and west. The site remains on the fringe of the contiguous built-up area of the city.

A series of mills located in the townlands of Kilcully and Kilnap date to this period, while a holy well located to the south of the proposed development site in Kilbarry townland may also date to this period. These sites are described as follows by the ASI:

*Mill - corn CO063-067----*
*On S bank of Glennamought River. Indicated on 1842 OS 6-inch map as three separate buildings, structure at NE end named 'Corn Mill'. Range of three buildings survive built into NW-facing slope with access on SE side at upper floor levels. Central 2-storey, rectangular structure (int.: 11.05m SW-NE; 6.2m NW-SE) appears to be remains of earliest structure with later mill attached at NE end: roofless rectangular 4-storey mill (int.: 13.3m NE-SW; 8.14m NW-SE) of 4 bays; brick-arched opes to windows. Wheel-pit (Wth 1.78m) along NE wall which housed high breastshot or overshot waterwheel. Arched opes in NE wall of mill suggests power was transferred into mill via pinion wheel. Support stones for machinery and two conglomerate millstones survive within. Mill race (dry) approaches from SW. Residential structure attached to SW end central structure; 2-storey, 3-bay. According to local information, house abandoned in 1973.*

*Mill - corn CO063-068001-*
*Indicated as 'Corn Mill' on 1842 OS 6-inch map, westernmost of four mills depicted in Kilcully, at least three using same millrace. Three-storey, 4-bay structure, windows have wooden lintels with brick relieving arches; upper levels collapsing, heavily overgrown. NW gable set into slope, mill race flows past SE gable; no details of wheel-pit arrangements survives. Second corn mill marked on 1842 OS 6-inch map c. 180m to NE may be incorporated into S half of heavily altered structure with millrace to W; no visible surface trace of 'Old Mill' shown on 1842 OS 6-inch map c. 80m to NE. Iron mill (CO063-06803-) survives c. 110m to E.*

*Mill – unclassified CO063-068002-*
*There are no visible remains of the 'Old Mill' which is indicated on the 1842 OS 6-inch map c. 80m to the NE of a corn mill (CO063-068001-).*

*Mill – unclassified CO063-068003-*
*Built against steep cliff, on N bank of Glennamought river. Roofless remains of 3-storey rectangular structure (int. 7.1m E-W; 6.1m N-S); gabled ended; brick quoins. Cut stone lined wheel-pit, along E gable. Along internal S wall are four large limestone support slabs. One of four mills depicted in Kilcully on 1842 OS 6-inch map (CO063-06801-).*

*Mill - corn CO074-112----*

*On S side of Kilnap Glen, site of Shaw's flour mills, built in 1830s, replaced in late 19th century by present mill, marked 'Corn Mill (disused) 'on 1902 OS 6-inch map, taken over shortly thereafter as sculpture works. Roofless square 2-storey red sandstone building with rusticated limestone quoins. N elevation of 6 bays, camber-headed brick-arched window opes, wide arched ope at N end of E wall with date '1871'. W wall removed when 2-storey addition built onto W side. Earth-filled pit in narrow yard outside E face; probably housing downward axial flow or pelton wheel turbine (Rynne pers. comm.) fed by cylindrical vertical duct. Iron water tank above shaft fed by brick-lined head race via lintelled culvert. To S, bed for cross compound steam engine; flywheel attached to crank driven eccentric rod which transmitted power to well preserved stone saw to N (Rynne pers. comm.). Arch at base of W wall of pit probably channeled tail race under mill. Interior of mill filled with rubble. S wall of earlier structure (long axis E-W) survives to S, revetting hillside; low brick-arched ope at E end leads at angle into earth-filled tunnel; according to local information flue led to octagonal brick chimney (H c. 10m) atop hill c. 50m to S. Second arch may be for boiler. One-storey gabled structure (long axis E-W) to E of mill, 6 bays on N elevation; second steam engine bed and remains of saw to E. Parts of retaining wall to S date from pre-1842 mill; no trace of wheel pits for two water wheels in use in 1860s (Rynne pers. comm.). Mill pond to E, substantially enlarged in late 19th century. Massive rusticated stone railway viaduct (constructed c. 1849) crosses E edge of site.*

*Mill - corn CO074-115----*

*No entry*

*Ritual site – holy well CO074-018----*

*Site of well recently re-discovered in rough grazing on W-facing slope. Some stone-facing and spring uncovered c. 2m below present ground level; a local group propose to restore the well. MacCarthy (1937,17-8) suggests that this is the 'site of the first church in Cork....Barre's Church' which he thinks likely to have been in 'a scrubby untilled patch twenty yards to the east of the well' (ibid.); this area remains as described by MacCarthy.*

*Excavations Database*

The Database of Excavation Reports (www.excavations.ie) contains summary accounts of licenced archaeological investigations carried out in Ireland (North and South) from 1969 onwards. It has been compiled from the published Excavations Bulletins from 1969 to 2010 and online material from 2011 onward. The Database records ten programmes of licensed archaeological investigations undertaken as having been undertaken within the study area. The majority of the investigations revealed nothing of archaeological significance, although a programme of testing undertaken in Ballincrokig (18E0059) in 2020 revealed archaeological features including a burnt mound/fulacht fia, three possible pits and a small deposit of dark brown silty clay and charcoal with fragments of cremated bone. This site is located circa 1km east of the proposed development site. Furthermore, an underwater archaeological survey (16D0044) undertaken within the Glennamought and Bride Rivers as part of a flood relief scheme identified a series of sixteen known or previously unrecorded features of historic significance within the original courses of the two river channels and a subsequent survey (17D0067) of another section of the Glennamought revealed a further 13 previously unrecorded features. The features generally related to milling activity and bridges. Please consult Table 11.6 below for full Excavation Database summaries.

In addition, a review of a National Museum of Ireland Finds Database (2010), published on www.heritagemaps.ie, revealed that it records no artefact discoveries within the study area other than those associated with the above excavations.

| Site name | Licence and author | Summary |
|---|---|---|
| Kilbarry | 04E1085<br>Avril Purcell | Eighteen test-trenches were excavated across this greenfield area in advance of the development of a business and technical park. No features or finds of archaeological significance were revealed in any of the trenches. |
| Ballincrokig | 18E0059<br>Avril Purcell | A total of fifteen trenches were excavated across the site following a geophysical survey. No features or finds of archaeological significance were revealed. It is proposed to preserve the site of the standing stone and the possible souterrain in situ within the residential development proposed. |
| Ballincrokig, Ballyvolane, | 18E0059<br>Avril Purcell | Monitoring was undertaken during construction of a residential development. No features or finds of archaeological significance were revealed within the development footprint. Monitoring was also carried out on a wayleave to accommodate services to the south-east of the development site adjacent to the Ballyhooly Road. A fulacht fiadh/burnt mound measuring 7.5m north-south x 8m was found in low-lying rough ground adjacent to a small stream at the eastern end of the wayleave. The spread was not fully exposed and was preserved in situ. Further monitoring will be carried out as the development proceeds. |
| Ballincrokig, Ballyvolane | 18E0059 (374)<br>Avril Purcell | The final stage of monitoring of topsoil stripping for this residential development was completed. A fulacht fia/burnt mound had been identified in a wayleave corridor associated with the development in 2019. No further archaeological features were identified. |
| Ballincrokig, Ballyvolane | 20E0586<br>Avril Purcell | Twenty-eight trenches were mechanically excavated across the site following a geophysical survey. Five archaeological features were revealed in four trenches including a burnt mound spread/fulacht fia, three possible pits 15-20m north of the ringfort (CO064-114) and a small deposit of dark brown silty clay and charcoal with fragments of cremated bone (totaling 1.1g) approximately 150m further to the north. The deposit appeared to be sitting on top of the subsoil and there was no evidence of a pit containing the cremated bone. The burnt mound spread/ fulacht fia and possible pits will be retained in situ within buffer zones. |
| River Bride and Glenamought River | 16D0044 & 16R0044<br>Rex Bangerter | Underwater Archaeological Impact Assessment (UAIA) of the River Bride and its tributary the Glenamought River. The work was carried out as part of pre-planning conditions associated with the River Bride (Blackpool) Certified Drainage Scheme. The in-water archaeological assessment comprised a 2.5km stretch of the River Bride and a 500m |

| Site name | Licence and author | Summary |
|---|---|---|
| | | section of the Glenamought River, extending from Kilnap Bridge in the north (upstream extent of study area) to the southern end of the Blackpool Architectural Conservation Area in the south (downstream extent). The assessment recorded riverbed topography and provided a detailed account of the existing riverside environment. On-site work comprised systematic non-disturbance waded inspection of the two river channels, their attendant bank structures, and any associated riverine features, including bridge structures (piers and foundations), weirs, culverts, river-walling, and any natural features encountered. Particular attention was paid to the assessment of two masonry bridge structures, located at Kilnap Glen and Fitz's Boreen, which are to be removed as part of the proposed drainage scheme. On-site work was carried out between the 3rd and 8th of April 2016, under licence from the DAHRRGA; licence numbers 16D0044 and 16R0044.<br>The River Bride, including its tributary the Glenamought River, has witnessed successive alteration/adaption of the waterways with the development of milling and other industrial activity in the nineteenth-century. In addition, the area has undergone extensive modern alterations as a result of the twentieth-century development of the surrounding landscape. Cartographic evidence supports the findings from the in-water survey that two substantial sections of the present day River Bride, running adjacent to the Commons Road, are created watercourses of twentieth-century date; running northwest to southeast at a distance of between c. 10m to c. 70m from the original line of river. The historic watercourse has been maintained along the southernmost section of the river, as it flows through Blackpool Village itself. The Glenamought River remains largely unaltered by twentieth-century intervention.<br>The UAIA identified a series of sixteen known or previously unrecorded features of historic significance within the original courses of the two river channels (Features F01-F16). The features include: four bridge structures (F01, F03, F07, and F09); multiple sections of river walling (F04A/F04B, F08, F10, and F15A/F15B); three masonry culverts (F13, F14/F14B, F16); a rubble stone weir (F05); section of a bridge arch (F11); a masonry culvert arch (F12); a millrace (F07) and the remains of a dam/ weir structure (F02). In addition, numerous cut-stone pieces (CS01-15) were encountered in the riverbed, along the upstream section of the Glenamought River survey area. The masonry pieces are associated with the construction of the Railway Viaduct in 1849 (Feature F03) and other stone-cutting activity that took place within the grounds of Kilnap Glen House in the nineteenth-century. Two further cut-stone |

| Site name | Licence and author | Summary |
|---|---|---|
| | | pieces were also identified at separate locations along the River Bride (CS16 and CS17). |
| Former Sunbeam Factory, Kilnap, Blackpool | 17E0441 Avril Purcell | Five trenches were mechanically excavated within the site of the former Sunbeam factory. The mill building which stood immediately to the south-west was destroyed by fire in 2003 and is not within the footprint of the proposed development site. A limestone flag surface was revealed at the east of the site which may be associated with the mill. No other features of archaeological potential were revealed. |
| Glenamought River | 17D0067, 17R0160 Rex Bangerter | Underwater archaeological impact assessment (UAIA) took place of a 940m-long section of the Glannamought River, an upstream tributary of the River Bride. This work is an addendum to the archaeological assessment previously undertaken by ADCO in 2016, as part of the EIS for the River Bride (Blackpool) Certified Drainage Scheme, the drainage scheme having been subsequently extended (June 2017) to include flood relief measures along the upstream section of the Glennamought River. The additional flood defence measures comprise: a continuation of channel maintenance works (C08_G01) upstream; the insertion of a roughing screen (C08_T01) upstream of Kilnap Bridge; insertion of an associated access trackway (C08_R02); construction of two sections of flood defence wall (C08_L02, & L03), located adjacent to Glen Mills; and construction of a flood defence wall and embankment (C08_L01 and C08_E01) upstream of Glennamought Bridge.<br>The UAIA assessment covered a 1km-long section of the Glennamought River, extending from Kilnap Viaduct to a point 106m upstream of Glennamought Bridge, ITM: 566471E, 575091N to ITM: 567248E, 575418N. An overlap with ADCO's previous archaeological assessment was included as part of the current survey. This overlap comprised a 60m-long section of the river, running between Kilnap Viaduct and Kilnap Bridge. The assessment recorded riverbed and bankside topography assessed the potential of riverbed deposits to retain archaeological material and identified any features/structures of archaeological or historic significance that were present. In addition, targeted metal-detection was employed to help assess the riverbed and highlight any metallic concentrations present within those deposits. On-site work was carried out on 29 and 30 August 2017.<br>The UAIA identified a series of thirteen known or previously unrecorded features of historic significance (Features F17-F29). These features comprise: five sections of river walling (F18, F21, F23, F26 and F28), the remains of a millpond (F17), a tailrace and associated culvert structure (F20), a mill boundary wall (F22), a section of masonry wall (F24), the remains of two weirs (F19 and F27), and two bridge structures (F25 and F29). An additional feature (F02A), not visible during the previous |

| Site name | Licence and author | Summary |
|---|---|---|
| | | (2016) assessment, was also recorded upstream of Kilnap Bridge. The feature is thought to be the remains of a weir/sluice structure associated with a dam (F02) that once crossed the river at that location. |
| Kilbarry, Cork | 03E1244<br>Avril Purcell | Monitoring was carried out on groundworks during development. No features or finds were revealed. A metal detector survey was carried out on the portion of the bed of the River Bride which ran through the site which had been diverted from its original course (licence 03R118). The partially dried-up riverbed was investigated with a metal detector following its diversion. A significant amount of modern rubbish was revealed; no finds of archaeological significance were identified. |
| Carhoo, Cork | 04E1613<br>Linda Hegarty | An assessment was undertaken in support of a planning application for permission to construct a private dwelling. The proposed house was near a circular enclosure. Three test-trenches (totalling 120m) were excavated. No features of archaeological significance were identified. |

**Table 11.13: Excavation Database descriptions of investigations within environs of study area.**

**Cartographic and Aerial Imagery Review**

The detail on historic cartographic sources demonstrates the nature of past settlements and land use patterns in recent centuries and can also highlight the impacts of modern developments and agricultural practices. This information can aid in the identification of the location and extent of unrecorded or partially levelled features of archaeological or architectural heritage interest. The cartographic sources examined for the study areas include the 17th century Down Survey mapping (Figure 11.3), the first edition 6-inch Ordnance Survey (OS) map (surveyed c.1840) (Figure 11.4) and the 25-inch OS map (surveyed c.1900) (Figure 11.5). The townland of Kilbarry is not depicted on the Down Survey map. Its later footprint appears to be contained within a large land parcel owned by the 'Countess of Barrimore'.

The first edition 6-inch OS map depicts the lands within the proposed development site as undeveloped, pasture fields. The field boundaries are relatively similar to their present form. A farmstead is depicted in the western portion of the site, off the Old Whitechurch Road. A number of these structures remain extant. Glenamought Bridge and a corn mill are depicted to beyond the western boundary of the proposed development. The lands surrounding the wider area around the proposed development are depicted as undeveloped, pasture fields.

The 25" historic OS map edition demonstrates several minor changes to the layout of the proposed development site. Several structures within the farmstead have been demolished, although the presence of a well is now indicated in this area. A strip of woodland is depicted extending along the southern bank of the Glennamought River in the northernmost portion of the site. 'Glenamoaght Bridge' and the corn mill continue to be depicted; however, the mill is now labelled as 'disused'. To the west of the proposed development site, 'Glen Mills' have been enlarged and redeveloped into the 'Glen Distillery'. There is no evidence of any potentially unrecorded archaeological sites or features depicted within the proposed development site on either of the reviewed early edition OS maps.

A review of aerial and satellite images detailing the subject lands reveals that extensive ground disturbance occurred in the eastern and north-eastern portions of the site in the early 2000's (see Figure 11.6 below). This disturbance appears to be related to the development of the Delany's GAA grounds to the east of the subject site. The reviewed imagery contains no obvious evidence of any potential unrecorded archaeological sites within the landholding.

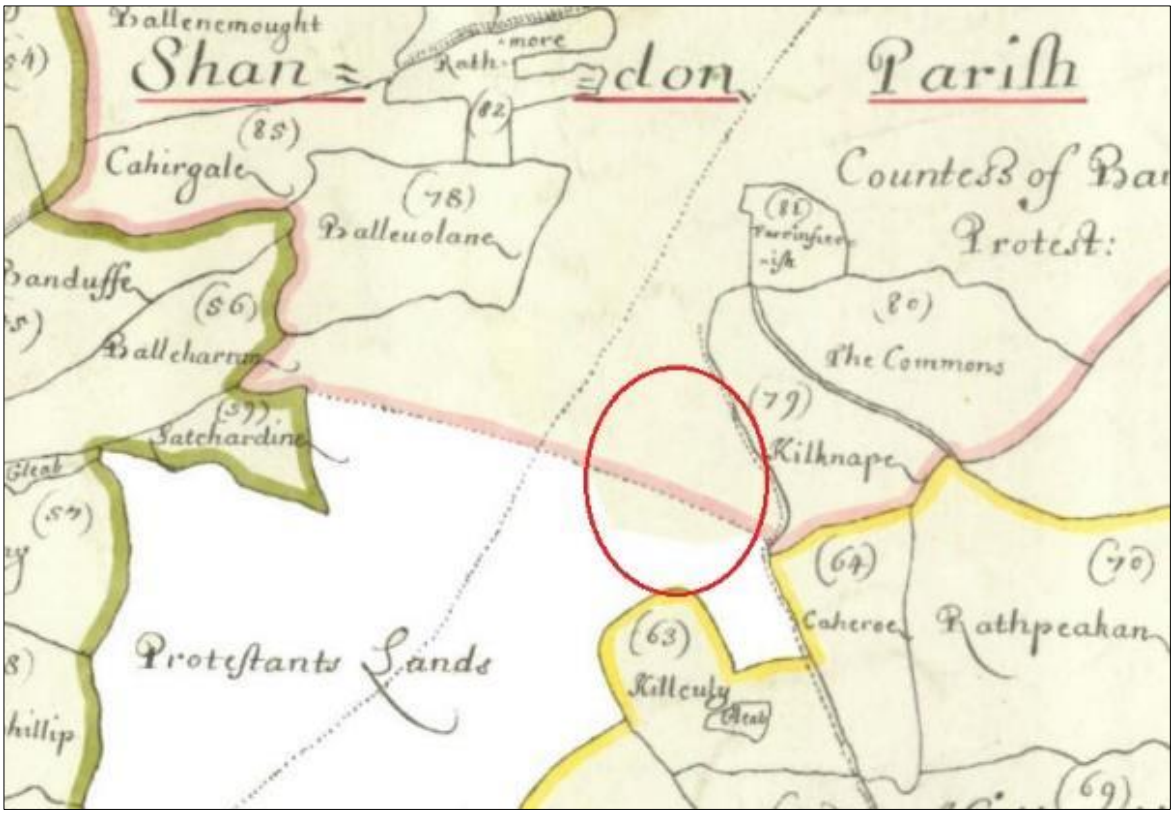


**Figure 11.10: Extract from the Down Survey mapping of depicting the general area of the subject site. Kilbarry townland is not named on the map. The approximate location of the proposed development site indicated with red oval symbol.**


**Figure 11.11: Extract from the First Edition 6-inch OS map with approximate boundary of the subject site depicted in blue (Ordnance Survey Ireland Licence No. SU 0003322).**

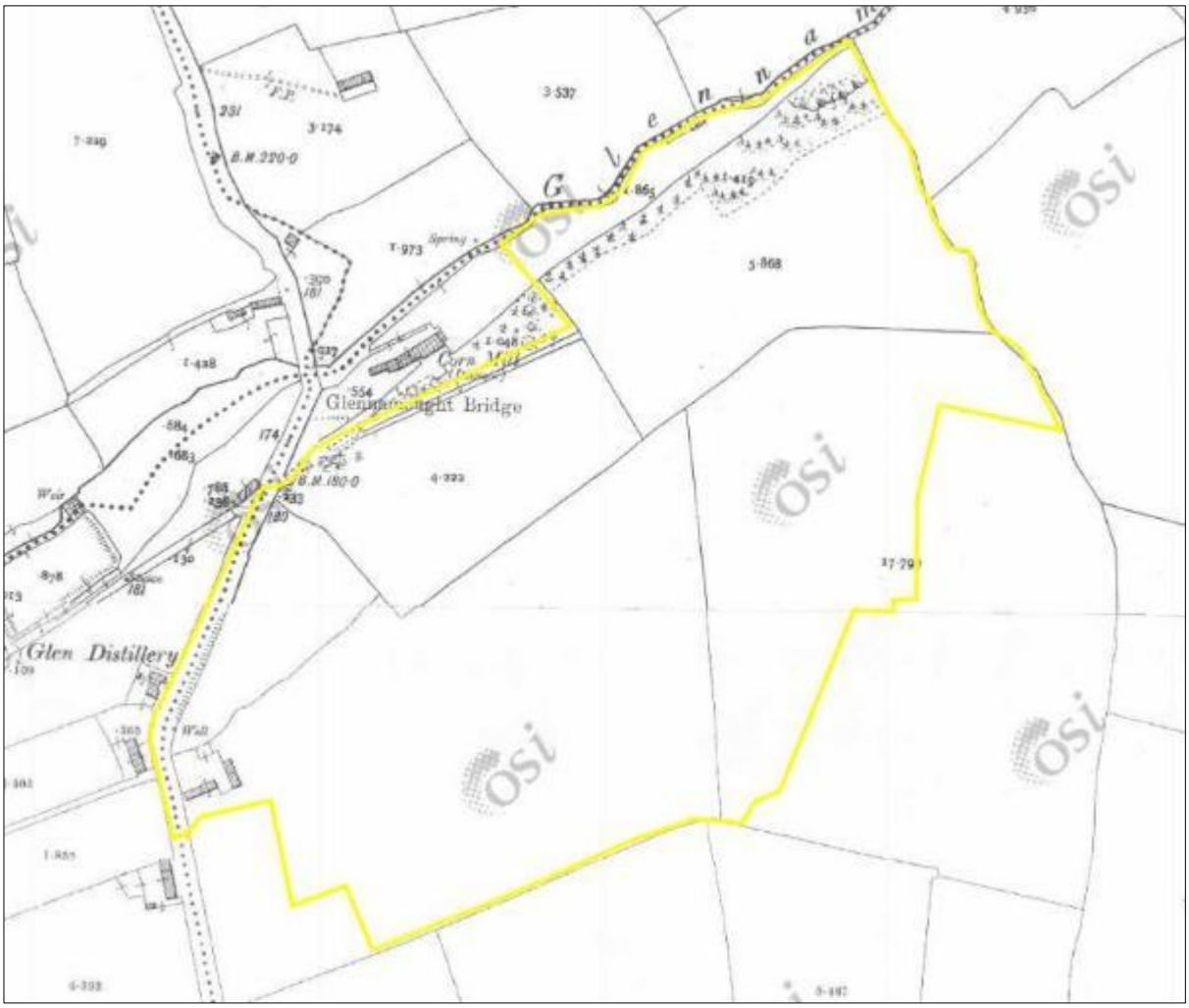


**Figure 11.12: Extract from the 25-inch OS map detailing the subject site and surrounds (Ordnance Survey Ireland Licence No. SU 0003322).**


**Figure 11.13: Aerial image centred over the proposed development site with modern ground disturbance evident in the eastern and north-eastern areas.**

**Architectural Heritage**

There are no NIAH-listed buildings or Protected Structures within the boundary of the proposed development site. There are three Protected Structures and eight structures listed by the NIAH within 1km of the proposed development site, the nearest of these to the PDS is Glennamought Bridge (20906320) which is located circa 40m north of the development site boundary (see Table 11.7 and Figure 11.7). The proposed development site is not located within an Architectural Conservation Area (ACA) as per the Cork City Development Plan 2015-2021 or the Cork City Development Plan 2022-2028. There are a number of undesignated 19th century farm related structures extant in the western portion of the proposed development site.

| NIAH Reg. no., RPS no. | Building | NIAH Rating | ITM E, N | Distance from development |
|---|---|---|---|---|
| 20858003 PS616 | Kilnap House | Regional | 566390, 575030 | 685m to west |
| 20858004 | Kilnap Bridge | Regional | 566534, 575108 | 530m to west |
| 20858005 PS617 | Kilnap Viaduct | Regional | 566475, 575075 | 600m to west |
| 20858006 | Chimney | Regional | 566450, 574990 | 695m to west |
| 20858007 | Bridge | Regional | 566452, 574994 | 740m to south |
| 20859001 | Delaney Brothers Monument | Regional | 567450, 574990 | 645m to southeast |

| NIAH Reg. no., RPS no. | Building | NIAH Rating | ITM E, N | Distance from development |
|---|---|---|---|---|
| 20906319 | Bridge | Regional | 566450, 574990 | 735m to west |
| 20906320 | Glennamought Bridge | Regional | 567162, 575344 | 40m to northwest |

**Table 11.14: Designated Architectural Heritage structures within 1km study area.**

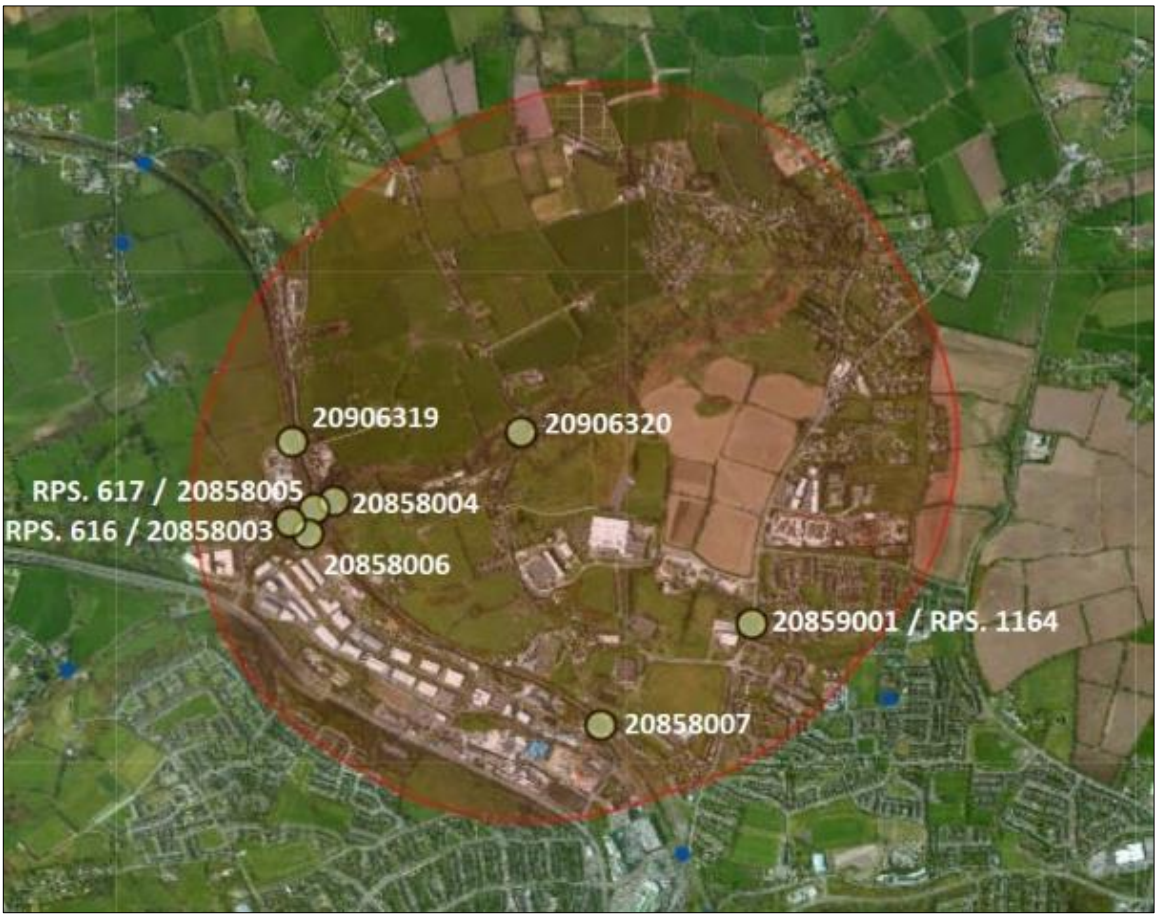


**Figure 11.14: NIAH-listed structures and Protected Structures within 1km of subject site.**

**Undesignated Cultural Heritage**

While encompassing the protected archaeological and architectural heritage resources, cultural heritage also includes various undesignated assets such as historic settlements, demesne landscapes, vernacular structures, folklore, placenames, townland boundaries and historical events. Other than the remains of 19th century farm buildings within the site boundary, there are no tangible cultural heritage assets, such as demesne lands or townland boundaries within the proposed development site. A review of the online transcribed material from the National Folklore Collection archive, which has been digitised and published online at www.duchas.ie, revealed that it contains no entries for Kilcully townland.

Townlands are the smallest unit of land division in the Irish landscape and many may preserve early Gaelic territorial boundaries that pre-date the Anglo-Norman conquest. The boundaries and nomenclature of the Irish townlands were recorded and standardised by the Ordnance Survey during the 19th century. The Irish origins of many townland names often refer to natural topographical features, but some name elements may also give

an indication of the presence of past human activity within the townland, e.g. lios or rath indicate the presence of a ringfort while names containing elements such as kill or temple are often indicative of ecclesiastical activity. The proposed development site is situated within the townland of Kilbarry, the English name of which is derived from 'Cill Bharra' which translates as 'church of Barra'. A holy well (CO074-018----) is located circa 285m to the south of the proposed development site. In 1937, a local historian named McCarthy suggested that this well was located at the site of St. Finbarr's first church foundation in Cork (McCarthy 1937, 17). Bar the etymological connection, there is no other evidence to support this theory.

**Field Survey**

An inspection of the proposed development site was carried out by David Murphy of John Cronin & Associates on Thursday 12th May 2022. The site was assessed in terms of historic landscape, land use, vegetation cover, presence and potential for undetected archaeological and architectural heritage sites/features. Weather conditions were dry and bright at the time of survey and this provided excellent landscape visibility. No access difficulties were encountered during the survey.

Appendix 11.1 of this chapter presents extracts from the photographic record of the site inspection.

The proposed development site is located to the northeast of Cork City Centre, and measures c. 15.52ha in area. The lands comprise open fields under grass, scrub, and gorse with established boundaries. An old hurling manufacturing factory lies derelict at the western side. The lands are bounded to their north by the Glenamought River and Valley. Here, the lands slope steeply down to the river and informal walking paths are evident. To the east, the lands are bounded by the Delaney's GAA grounds. Along the southern margin of the site, a roadway extends between the GAA club and the Old Whitechurch Road. Further to the south, and to the southeast beyond the GAA grounds, lie IDA lands within the Kilbarry Business and Technology Park.

At the time of field inspection, the majority of the site was fallow and overgrown which limited the visibility of any possible low relief features. A large portion of the lands can be considered to possess a low archaeological potential due to steeply sloping ground conditions (north and northwest areas), as well as modern ground disturbance. Extensive ground disturbance has occurred in the eastern and north-eastern portions of the site. This appears to be related to the development of the Delany's GAA grounds in the early 2000's. The more level and less disturbed central and south-western portions of the site can be considered to possess a moderate archaeological potential. The results are detailed in Table 11.8 and extracts from the photographic record are presented in Appendix 11.1.

| Field number | Description |
|---|---|
| 1 | This is an irregularly shaped, fallow field which measures c.265m north to south, and c.380m east to west (maximum measurements). A hardcore road extends across the southern margin of the field, orientated east to west. A number of burnt out and rusting vehicles were evident in this area. This would suggest that the area is unsuitable for geophysical survey. The field is bounded by scrub and overgrowth with sporadic tree-line boundaries along the south, western, and northern margins. The eastern margin of the field is bound by metal railings which enclose the GAA pitch. The field slopes upwards to the northeast and the highest point of the field is within this northeast corner. This area appears to be formed by a manmade |

| Field number | Description |
|---|---|
| | earthen platform, this is likely related to groundworks undertaken in association with the development of the adjacent Delany's GAA grounds in the early 2000's. This area is heavily overgrown with scrub etc. There are expansive views to the west and northwest. Overhead powerlines extend northeast to southwest across the north-eastern section of the field |
| 2 | This is an irregularly shaped fallow field with areas of overgrowth. The field measures c.155m southwest to northeast, c.66m northeast to southwest (maximum measurements) Three large 20th century industrial sheds are contained within the area which are constructed of concrete walling with asbestos roofing. These structures are no deemed to be of any architectural heritage interest. There is a 19th century farmyard compound to the southwest portion of the field. Within this compound there is a vernacular building with a number of adjacent outbuildings. These are constructed of sandstone and brick and are single storey with possible lofts. While the structures within the yard are typically in ruinous condition and are not of architectural significance, they do comprise features of local cultural heritage interest as remains of 19th century agricultural activity in the area. |
| 3 | This is an irregularly shaped, fallow pasture field. The field measures c.60m northwest to southeast and c.130m northeast to southwest (maximum measurements). A stone revetted earthen bank forms the boundary with Field 2. The earthen bank measures c.1.0 – c.1.2m in height and c.2.0m in width. The entrance was previously dissected by a machine. There is surface evidence for previous investigations, probable trial pits. The field is bounded on all margins by overgrowth and scrub which are topped by a deciduous tree-line. The northwest portion of the field borders Old Whitechurch Road. The road lies at a lower level to the field. |
| 4 | This is an irregularly shaped, heavily overgrown, fallow field which measures c.180m southwest to northeast and c.90m northwest to southeast (maximum measurements). The field is bounded by overgrowth and scrub on all sides. The extent of overgrowth reduced the ability to visually assess the field for any potential archaeological features. The terrain within the field slopes to the north and has a steep drop off to the bottom Glenamought River valley. A number of overhead powerlines extend across the field in a northeast to southwest direction. |
| 5 | This is an irregularly shaped, heavily overgrown, steeply sloping fallow area. The area measures c.123m east to west and c.170m north to south (maximum measurements). Again, the extent of overgrowth limited the visibility within the area and the potential for the identification of any potential archaeological features. There is a sharp drop-off from the northeast margin of field 1 into field 5. A number of overhead powerlines extend across this area. The surface undulates and trends steeply downwards to the north towards the Glenamought River. There is a small floodplain on the southern bank of the river in the very northern margin of the area. There is evident outcropping of bedrock at surface level in the central portion of the field, while other evident surface undulations within the field appear to have formed as a result of natural processes. |

**Table 11.8: Field Descriptions (field numbers indicated on Figure 11.8).**


**Figure 11.8: Aerial image of proposed development site with indicative outline of proposed development boundary shown (yellow outline), field survey areas indicated (source: www.google.ie/maps).**

**Summary**

The proposed development site does not contain any recorded archaeological sites or designated architectural heritage structures and it is not located within an Architectural Conservation Area. In addition, no potential unrecorded archaeological sites were identified within the proposed site during the desktop research and field survey studies carried out as part of this assessment.

None of the recorded archaeological sites located within 1km of the site boundary are listed as National Monuments or have been assigned Preservation Orders. The archaeological sites within the study area are in varying states of preservation, including examples which retain no surviving surface traces, and are deemed to comprise cultural heritage assets of low to high values. The majority of the archaeological sites are located in areas not visible from the proposed development site and none comprise monument types with visually sensitive alignment attributes such as megalithic tombs, stone circles or stone rows. The nearest recorded archaeological site to the proposed development are the derelict remains of a corn mill (CO063-067----) which is located in a private property c.25m to the north of the proposed development boundary. The unroofed mill building remains are built into a northwest-facing hillslope behind an area of overgrowth to the south and are in an area not visible from the proposed development. The review of historic mapping did not reveal any associated features, such as millraces, located within the proposed development site. There are no other recorded archaeological sites located within 285m of the proposed development.

There are no Protected Structures located with 600m of the proposed development site and it is not located within an Architectural Heritage Area. There are also no curtilage features, such as demesne lands, associated with Protected Structures within the proposed development site or within its close environs. The nearest NIAH-listed structure to the proposed development is Glenamought Bridge (ref. 20906320) which comprises an in-use road bridge located 40m outside the northwest section of the site boundary and is not visible from the proposed development. There are no other NIAH-listed structures located within 530m of the proposed development. The majority of the designated architectural heritage resource within the surrounding 1km study area comprise structures associated with post-medieval and early modern milling and transport activities and comprise features of medium to high values.

The derelict remains of a number of 19th century farm buildings are located within the proposed development site. While these buildings are not listed in the RPS or NIAH they do comprise features of local (low) cultural heritage interest.

## 11.3 Characteristics of the Proposed Development

The proposed development, as described in Chapter 4 of this EIAR, will require extensive ground excavation works to facilitate construction works. It will also consist of the demolition of a disused hurley manufacturing factory and associated out buildings, the removal and replacement of the southern and eastern boundary treatments, as well the creation of formalised walking paths to replace the informal walking paths located to the north of the site, a new through road from the proposed site access on the Old Whitechurch Road to Delaney's GAA Grounds and accessing the Upper Dublin Hill Road, with associated new boundary treatments at Delaney's GAA club, all associated ancillary site development and hard and soft landscaping works.

## 11.4 Potential impact of the Proposed Development

### 11.4.1 Do nothing scenario

A 'Do Nothing Scenario' will see to the continued preservation of recorded and potential cultural heritage features within the study area.

### 11.4.2 Potential Impacts

**Construction phase**

There are no recorded archaeological sites located within the proposed development and the construction phase of the proposed development will, therefore, have no predicted impacts on the known archaeological resource. While there was no evidence for any unrecorded archaeological sites within the proposed development site identified during the desktop study and field inspection, the potential for the survival of unrecorded, sub-surface archaeological features and artefacts within its boundary cannot be discounted. As the existence, nature and extent of any unrecorded archaeological features or artefacts within the proposed development site are unknown; the significance of potential construction phase impacts cannot be quantified but ground excavation works will have the potential to result in permanent, direct, negative effects on any such remains and this will require mitigation.

There are no designated architectural heritage structures, or associated curtilage lands, located within the proposed development and it is not within an Architectural Conservation Area. The construction phase of the

proposed development will, therefore, have no predicted impacts on the designated architectural heritage resource. The derelict remains of a number of 19th century farm buildings are located within the proposed development site. While these buildings are not listed in the RPS or NIAH they do comprise features of local (low) cultural heritage interest and their removal will result in a moderate negative impact on the undesignated cultural heritage resource which will require mitigation.

**Operational phase**

Following the successful implementation of the pre-construction mitigation measures presented in Section 11.5.1.1 no impacts on the cultural heritage resource are predicted to arise during the operational phase of the proposed development.

### 11.4.3 Mitigation measures, Monitoring and Residual Impacts

### 11.4.4 Mitigation & Monitoring

**Construction Phase**

Given the scale and extent of the proposed development within a green field location, a programme of archaeological test trenching, under licence by the National Monuments Service, will be carried within the undisturbed areas of the proposed development site in advance of the construction phase. In the event that any sub-surface archaeological deposits, features or artefacts are identified during these site investigations, their locations will be recorded and securely cordoned off while the National Monuments Service are notified of the discovery and consulted to determine further mitigation measures, which may entail preservation in situ by avoidance or preservation by record through a systematic archaeological excavation. A detailed building survey of the farm buildings within the proposed development site will be compiled in written and photographic formats in advance of the construction phase.

There are a number of obligatory processes to be undertaken as part of applications to the National Monuments Service for licences to carry out archaeological test trench excavations and these will allow for monitoring of the successful implementation of mitigation measures. A detailed method statement stating the proposed strategy for the site investigations will accompany the submitted licence application which will clearly detail the extent of the archaeological works and outline the processes to be enacted in the event that any archaeological features are encountered. Reports on the archaeological site investigations will then be submitted to the National Monuments Service, the National Museum of Ireland and the Planning Authority which will clearly describe the results of all archaeological works in written, mapped and photographic formats. A copy of the building survey of the derelict farm buildings within the proposed development site will be submitted to Cork City Council.

**Operational Phase**

All required mitigation measures will be enacted prior to and during the construction phase and, therefore, no cultural heritage mitigation measures during the operational phase of the proposed development are predicted.

### 11.4.5 Residual impacts of the Proposed Development

**Construction Phase**

The proposed development site does not contain any known archaeological sites or designated architectural heritage structures and no residual impacts on these elements of the cultural heritage resource are predicted. The mitigation measures presented in Section 11.4.4.1 will provide for either the preservation in situ of any currently unknown archaeological features within the proposed development site or the proper and adequate recording of this resource by full archaeological excavation. Preservation in situ shall allow for a negligible magnitude of impact resulting in a potential not significant/imperceptible significance of effect in the context of residual impact on the unrecorded archaeological resource. Preservation by record shall allow for a high magnitude of impact, albeit ameliorated by the creation of a full and detailed archaeological record, the results of which shall be publicly disseminated. This shall result in a potential slight/moderate negative range of significance of effect in the context of residual impacts on the unrecorded archaeological resource. The removal of the undesignated, derelict farm buildings within the site will result in a high magnitude of impact on features of low cultural heritage value and this will be ameliorated by the creation of a detailed building survey which shall result in a slight/moderate negative range of significance of effect in the context of residual impacts on the undesignated cultural heritage resource.

**Operational Phase**

Following the successful implementation of the mitigation measures presented in Section 11.4.4.1 no residual impacts are predicted to arise during the operational phase of the proposed development.

## 11.5 Cumulative impacts

A review of operational, permitted, and proposed developments within the environs of the proposed development site was carried out in order to assess potential cumulative impacts on the cultural heritage resource. This included a review of available archaeological and cultural heritage impact assessments of these developments included in the online planning files published on the Cork City Council and Cork County Council planning enquiry systems as well as the Excavations Database.

### 11.5.1 Construction phase

Given the absence of significant direct impacts on the recorded cultural heritage resource arising from the proposed development in combination with the results of the above review of relevant projects in the vicinity of the subject lands, the proposed project is not predicted to contribute to any significant direct cumulative impacts on the cultural resource of the wider area. It is, therefore, concluded that the project will not act in combination with the reviewed developments to result in likely significant indirect negative cumulative impacts on cultural heritage resources in the vicinity of the subject site.

### 11.5.2 Operational phase

Given the absence of significant direct impacts on the recorded cultural heritage resource arising from the proposed development in combination with the results of the above review of relevant projects in the vicinity of the subject lands, the proposed project is not predicted to contribute to any significant direct cumulative impacts on the cultural resource of the wider area. It is, therefore, concluded that the project will not act in combination with the reviewed developments to result in likely significant indirect negative cumulative impacts on cultural heritage resources in the vicinity of the subject site.

### 11.6 Interactions

There are no predicted interactions between effects on other environmental factors that will result in any likely impacts on the cultural heritage resource.

### 11.7 Difficulties in compiling information

There were no difficulties encountered during the compilation of this assessment.

### 11.8 References

Cork City Council (2015) *Cork City Development Plan 2015-2021*

Cork City Council (2022) *Cork City Development Plan 2022-2028*

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National Monuments Service (2006) Guidelines for Authors of Reports on Archaeological Excavations. Government of Ireland.

Power, D. et al. 1994 *Archaeological Inventory of County Cork, Vol.2: East and South Cork*. Dublin, Stationery Office.

Online Sources:

Database of Irish archaeological excavations: http://www.excavations.ie/

Geohive Mapviewer resource: http://www.geohive.ie/

Google Earth Pro: https://www.google.com/earth/versions

Heritage Map Viewer - various interactive heritage maps:
https://heritagemaps.ie/WebApps/HeritageMaps/index.html

Irish heritage website: https://heritageireland.ie/

Landed Estates Database: https://landedestates.nuigalway.ie/LandedEstates

National Folklore Collection : https://www.duchas.ie/

Placenames Database of Ireland: https://www.logainm.ie/en/

Teagasc Soil Map: https://gis.teagasc.ie/soils/map.php

The Down Survey of Ireland: http://downsurvey.tcd.ie/

## 12.0 LANDSCAPE AND VISUAL

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Table 12.1: Impact Definition

## 12.1 Introduction

This chapter of the EIAR is an appraisal of the existing landscape at a site zoned for development located at Kilbarry, Cork. It also looks at the wider context of its situation within northern environs of the city and the rural landscape context as it straddles the rural urban divide. It will describe the proposed development and how this will physically change the site and landscape. It will proceed to assess the likely landscape and visual impacts that will be created due to proposed development within the site area. Mitigation strategies will be explained and residual landscape and visual impacts identified post such mitigation measures.

The landscape and visual assessment of the site and environs has been ongoing since the inception of the project in March 2019 with regular site visits undertaken since then and visits with other members of the design team at various stages to review and improve the design proposals in relation to ecology in general. Planning Authority development plans, project drawings, 3d views and photomontage images, as well as various specialist reports and documents prepared for the EIAR were reviewed in the preparation of this chapter.

## 12.2 Statement of Competence

### 12.2.1 Kieran McDonogh

Kieran McDonogh B.Arch., Dip. Arch., qualified from the Humberside Polytechnic in 1990 completing his post graduate diploma within the landscape unit at the School of Architecture. Kieran has been in practice since 1990 and has over thirty-two years of experience in both architecture and landscape architecture inclusive of the preparation of landscape and visual assessments.

Kieran has been involved in both the architectural and landscape design of this development site at Kilbarry from the outset and has prepared the landscape masterplan.

## 12.3 Methodology

Assessment of the site takes into account the sensitivity of the landscape and its ability to accommodate change. The methodology is founded on national and local government policy guidance, current legislation and best practice. A wide range of published and unpublished material relating to the site and its environs was consulted; references in Section 12.11.

A landscape and visual assessment has two components. The primary is visual impact, that is the degree to which a proposed development and its integral alterations to the existing landscape may be seen. In tandem is the impact on the landscape character, examining responses which may be felt towards the combined effects of the new development.

Landscape character encompasses many other measurable impacts such as noise, odour, ecology, history - as well as emotions and perceptions such as expectations, experience and personal circumstances. It also needs to cross-reference with other appropriate specialist topics such as biodiversity and cultural heritage.

The assessment of visual impact requires an in depth understanding of the site; topography, vegetative cover, existing structures and other features together with the likely carrying capacity of the lands for development. At Kilbarry the proposed development is, in the first instance, defined by the zoning first bestowed on the lands by the planning authority. This requires a development delivering primarily residential structures ranging from detached to larger apartment structures together with a childcare facility over the southern area of the site. A second zoning for Open Space for Recreation is applicable to the northern section of the site. An essential element of the lands zoning are upgrades to existing roads and the delivery of a new road link through the site. Within the context of the brief outlined by the local authority in its zoning guidance, the site is assessed at a range of scales and on an ongoing basis as the clients brief and resulting designs evolved over time.

This assessment first identified and agreed with the local authority a series of key vantage points from which the development proposals would be potentially visible.

The assessment of Landscape Character seeks to scientifically examine responses which are felt towards the combined effects of the new development. Such an assessment is complex because it encompasses many other measurable impacts such as noise, odour, ecology, history - as well as emotions and perceptions such as expectations, experience and personal circumstances. Attempts to scientifically measure feelings and perceptions are not reliable.

> *"13.5.2 Landscape is the context in which all changes take place. Change can be driven by natural forces (e.g. climate) but is largely the result of the actions of many different people and agencies, which is often not coordinated.*
>
> *The challenge we face is to manage our landscapes so that change is positive in its effects, so that the landscapes which we value are protected and those which have been degraded are enhanced. Meeting this challenge is a key element in achieving sustainable development." (Cork County Development Plan 2014)*

Descriptions of landscape effects also need to cross-reference with other appropriate specialist EIAR topics such as biodiversity and cultural heritage. Factors such as noise, odour, traffic and safety also influence perception of landscapes and are considered. The range of criteria employed to measure impact are outlined in Section 12.7 Potential Impacts.

Graphic images have been prepared to assist and inform this assessment these include before and after photographs / photomontages. 3D images were prepared to look at views within the proposed development area. The photomontage viewpoints are from positions located outside the site area. The viewpoints (receptors) were discussed and agreed in advance with the local authority planning department as being the key locations to inform a visual and landscape impact assessment. Photomontages are provided in Appendix 12.1 (EIAR, Volume 3).

## 12.4 Receiving Environment – The Site Context


**Figure 12.1: Zone of Visual Influence showing the viewpoint locations for the photomontage views.**

The proposed site is located within the development boundary of Cork City, a suburban area located at the edge of the city where it extends north to the steep Glenamought valley a river flowing west to the Bride which joins the Lee further south. This is a narrow glen with a mixture of existing meadows and scrub woodland. This portion of the site is zoned as open space. North of the river the lands are zoned Metropolitan Greenbelt and are in Agricultural use. Upstream the glen has similar scrub woodland and is part of the open space zoning. To the west (downstream) an Old Mill converted to residential use and its grounds indent the lower riverside section of the site. This separates it from the Glenamought Bridge and the Old Whitechurch Road.

From the residential zoned area above the glen there is agricultural land on prominent rolling hills visible to the north and west and the city is visible to the west and south. To the east the scrub and agricultural lands are visible these are zoned for Open Space and Industrial uses. To the north east across the valley the Rosemount residential estate is visible together with electrical power lines and pylons. There is an existing GAA Sport Club Ground bounding with the site on the east side of the area zoned for residential development. To the south the development site bounds with the Kilbarry Business Park which presents rear elevations, car park and yard areas as well as screen landscaping along its boundary to the site.

The area of the actual site is 15.52Hectares sitting on ground sloping gently from south to north on a plateau like area before rapidly falling at the valley wall dropping to the Glenamought River below. The lands zoned residential in general are at an elevation similar to existing and proposed development areas to the east and south. The industrial zoned are to the east is on land that rises enough to conceal the development along the Upper Dublin Hill a short distance away and to view point at a greater distance.

## 12.4 Receiving Environment – The Development Site


**Figure 12.2: Proposed development site with constraints.**

The entrance to the development site is located on the Old Whitechurch Road and is a short laneway to the northside of an existing bungalow dwelling (Sunville T23CY26). The front garden of the residence has hedge screening in place to the road and the laneway. The rear garden of this dwelling has a 1m high chain-link fence in place at the rear of the dwelling to the side of the lane and at the rear of the garden. There is very little screen vegetation in place, so this garden lack privacy and is very exposed to the site.

**Photo 12.1: Sunville no screen hedge planting is in place on the rear side boundary.**

**Photo 12.2: Sunville, a chain link fence defines the rear boundary leaving the rear garden open to view.**

The next dwelling (T23TCW4) also has a chain link fence as its rear boundary but there is more vegetation in place affording the rear garden some privacy.

**Photo 12.3: Leyland Cyprus and Eucalyptus screen planting at the rear of gardens backing on to the site.**

The next two dwellings have hedgerow planting and mature trees in place and are well screened from the development site. The four dwellings are at a lower elevation to the development lands.

**Photo 12.4: Existing hedgerow vegetation to the rear of dwellings backing on to the south west corner of the site.**

**Photo 12.5: The rear boundary of T23 XTX3 note in the distance the Telephone Exchange on Upper Fairhill is visible in the distance.**

The southern boundary to the development site is a continuous palisade security fence enclosing the Kilbarry Business Park. There are two large industrial / warehouse units close to the boundary with blank rear elevations, car parking and yard areas. The boundary line has an earth berm along the south side of the palisade fence where landscape with trees and shrubs is in place and provides an effective screen.

**Photo 12.6: The boundary with the Kilbarry Business Park.**

**Photo 12.7: Boundary to the Kilbarry Business Park with screen planting to car park area beyond.**

The southern boundary turns north and Delaneys Hurling and Football Club grounds share a boundary with the development area of the site. This boundary is continued with tall palisade fencing. There is a generous car park area and a single storey clubhouse and a pitch further east. Further north beyond the clubhouse structure the boundary steps in with a mass concrete wall structure forming the corner. The boundary then continues again in tall palisade fencing. There is a mature line of Leyland Cyprus set back from and running along the east side of the fence and this screens the main pitch area from view.

**Photo 12.8: View south east across the Delaney's Carpark to the training pitch and with the Kilbarry Business Park beyond to the south.**

**Photo 12.9: Delaneys Clubhouse presenting a blank elevation towards the site boundary.**

**Photo 12.10: Delaney's Main Pitch Area secured with palisade and fully screened with Leyland Cyprus.**

The boundary with Delaney's turns east at the north end of the Main Pitch and terminates where the site meets the line of old field boundaries running north south from the east side of the Delaney's Grounds running north as far as the Glenamought River in the valley below. The East side of the Delaney Grounds is also well vegetated and provides a secondary layer of screening between the site and lands further east towards Upper Dublin Hill.

**Photo 12.11: A view south east across the Main Pitch showing the screen vegetation on the club ground eastern boundary with industrial zoned lands.**

**Photo 12.12: The north end of Delaneys is further enclosed with Palisade fencing but with no screen planting**.

**Photo 12.13: The view north east from the north west corner of Delaney's Main Pitch with High tension wires and pylons in view.**

**Photo 12.14: View along power line route north east with Rosemount Estate visible in the near distance circa 0.6km away.**

While pylons and high-tension power lines are unsightly there is only one pylon within the development site where the overhead line transfers to underground ducts. The existing powerline leading away from the site boundary does not have a very significant visual presence in the landscape from within the site. The site unlike many on the northern periphery of the city does not any significant overhead power lines with wayleaves. There are a number of less significant overhead lines noticeable from within the lower glen area of the site.

**Photo 12.15: View from north east corner of Delaney's main pitch over industrial zoned lands and towards Upper Dublin Hill. This area is currently set out as meadows. The hedgerows and treelines conceal development further east.**

**Photo 12.16: View north of the eastern site boundary taken from offsite with expansive views across Metropolitan Greenbelt in the near distance and with the hilly rural landscape beyond.**

The eastern boundary is well vegetated with scrub woodland and is quite dense generally making it difficult to walk along side it. The industrial and open space zoned areas on the east side of the boundary are set in open meadows and there has been a recent fire making it more accessible further north.

**Photo 12.17: View from eastern boundary on adjoining lands area zoned for open space looking north east up the glen with the Rosemount Estate partially in view.**

As one descends into the valley views change significantly and become more restricted by the steep terrain and by existing scrub woodland and thickets of blackthorn etc. There are views onto the opposing valley wall. The landscape is very picturesque within the Glen within the meadow areas on the slope area and the wet meadows and woods on the valley floor. At the base of the valley the space is very enclosed with no external views available due to tree vegetation and the steep terrain.

**Photo 12.18: View from within the site looking west along the valley with some dwellings in view on the north facing slope.**

**Photo 12.19: View north west looking in to the base of the valley where wet meadows are visible.**

**Photo 12.20: View west over the wet meadow area on the south side of the river. This is a very enclosed environment with no external views.**

The northern side of the plateau where lands are zoned for residential use above the valley floor is very exposed to view looking out northward across the valley toward the Metropolitan Greenbelt. There are approximately 7No. of dwellings visible out in what is otherwise a rural landscape of fields, hedgerows, and treelines. This is now within the boundary of Cork City and beyond the River Glenamought the area to the city boundary is designated Metropolitan Greenbelt.

**Photo 12.21: View north from the upper plateau area looking out along the route of the Old Whitechurch Road with some dwellings visible fronting on to the road.**

At the north west corner of the site is indented by an old mill building now a residence. This is located on the valley floor and it is fully concealed from view by vegetation and terrain. Close to the entrance from the Old Whitechurch Road there is a ruinous old factory structure and this has become overgrown and enclosed with vegetation on its western side. From this area there are restricted views due to existing scrub woodland and more mature trees along the sloped terrain falling to the Old Whitechurch Road. Views of existing dwelling on the west side of the Old Whitechurch Road are not available from within the site only one roof was visible (see photo 12.23 below).

**Photo 12.22: Disused workshop on the western side of the development site due for demolition.**

**Photo 12.23: Aerial view showing the general context along the western/Old Whitechurch Road side of the development site shown outlined in red.**

## 12.5 Distant Viewpoints

Distant views from the site out have been mentioned and include views west to Upper Farranree and south west towards Spur Hill. Northwest towards Blarney and north out across the rural landscape towards Whitechurch. Any potential viewpoints are so far distant that no impact is deemed possible from the development of the proposed site. At such distances and vantage points the entire townscape of Cork City or what may be seen of it is visible and the proposed development is visible will simply form an element an element in the overall urban landscape.

## 12.6 Characteristics of the proposed development

The subject lands are located within Kilbarry on the northern fringe of Cork City. The site consists of a total landholding of 15.52 Hectares which abounds the old Whitechurch Road to the west, the City North Business Park to the south, the existing GAA grounds of Delaney's GAA Club to the east and with the Glenamought River along the northern boundary. The site includes a portion of the Delaney's GAA club grounds as well as the existing access road to the GAA club from Dublin Hill to facilitate the creation of a link road from the Old Whitechurch Road to Dublin Hill. The main area of the lands can be separated into two distinct sections, the relatively flat areas to the south which encompasses the residentially zoned lands and the areas which slope steeply down to the river valley along the northern portion of the lands which are zoned for Open Space. There are a number of existing residential dwellings in the southwestern corner of the site as well as further houses which run on the opposite side of the Whitechurch Road on the western boundary. There is a large industrial unit to the south which is close to the boundary with the site and is accessed from the Kilbarry Business Park. The lands are open along the northern boundary with views across the river valley and there are significant views west along the edge of the slope towards the existing Kilnap railway viaduct across the Glenamought Valley.

The site can currently be accessed at two locations, from an existing laneway access off the Whitechurch Road to the southwest corner of the site just to the north of the existing dwellings and also from the carpark of the Delaney's GAA pitch to the east. Along the Old Whitechurch Road the lands fall steeply down to the road and there are high tension ESB cables and pylons which are located in the northeast corner of the site.

The proposed development consists of a total of 319 housing units, along with a creche and associated development. The design incorporates a link road from the Old Whitechurch Road to the west to the existing link road which accesses Delaney's GAA grounds to the east from Dublin Hill. The site includes a portion of the carpark area and grounds of Delaney's GAA to facilitate the new road connection along with associated footpaths and cycleways.

The design proposes a new entrance building in the form of a 3storey duplex block as you enter the site from the Old Whitechurch Road. This block which has its parking in a courtyard to the rear creates an urban edge to the proposed new road which leads to a new plaza space within the development which is formed by further Duplex Blocks C and D along with the proposed Creche which backs onto and protects the rear gardens of the existing dwellings to the southwest of the site. This plaza with a raised table and high-quality surface finishes facilitates safe movement of residents to the creche from the housing development, while creating a distinctive urban node within the development.

The proposed link road continues along the southern boundary of the site and is fronted by wide terraced houses with a home-zone area to their front. This along with the use of parallel parking brings the housing development closer to the main road, and along with the trees lining both sides of the road creates a boulevard. This road also provides a suitable buffer from the residential development proposed and the existing industrial estate in Kilbarry immediately to the south of the development. The road continues through the GAA grounds with a new access point to the GAA carpark also included.

The residential development is designed as a series or urban blocks with loop roads and home-zones where possible. These urban blocks are positioned to create a number of pocket amenity parks within them to ensure that each house has easy and close access to public open space. They are also aligned to create permeable pedestrian routes through the development to connect at a number of points from the new link road to the south to the new public park in the northern portion of the lands and from west on the Old Whitechurch Road via the new public plaza towards the GAA pitch to the east.

Along the northern boundary of the residential lands the ground falls steeply away down to the Glenamought river which is down in a valley below the site. In order to create an urban edge to the development and the wider area 3 apartment blocks which are 4 and 5 storeys tall are proposed along the edge of the development lands which step down in response to the existing slopes and which overlook the proposed new public park to the north of the site. Other housing also overlooks this park as one travels both east and west from the apartments.

The proposed public park is connected to the development via a series of pedestrian routes and cycleways which connect the public park to the lands to the east where future residential development is proposed while also linking back though the development to the proposed new link road. On the east side of the overall development a combined pedestrian and cycleway runs south from between Apartment Blocks F

and G, linking a number of proposed recreation spaces including a kickabout area, a playground, and an external gym which are located around within the open spaces around the apartment blocks. This route also links back into a further node within the scheme which is a second public space, this one which includes a public space for outdoor events, before continuing south to link finally to the link road.

To assist in reducing the impact of cars on the public spaces within the development, there a number of home-zones within quieter residential areas, along with traffic calmed areas through the use of raised tables, narrowed roadways and a change in surface treatment. These are located at junctions to facilitate ease of movement for pedestrians along desire lines though the development. Development is designed to turn corners and to avoid private rear garden space meeting public space where possible through the extension of front gardens around corners or the use of inset areas of planting to separate private rear garden walls from footpaths.

The development responds to each boundary in an appropriate way. Along the southern portion of the GAA grounds the development has been turned to face the boundary to assist in passive surveillance of the GAA facilities and to create an appropriate entrance to the development as you head west along the link road from Dublin Hill. Two possible future access pointed form the housing development have been allowed for subject to agreement with Delaney's GAA club which can assist in integrating the GAA club and its amenity resource into the overall area.

Further north along the boundary with the GAA where this meets the side of the existing main pitch housing backs onto this boundary in response to the changed boundary condition which consists of overgrown areas and existing trees within the GAA grounds which do not afford any potential for passive surveillance.

To the southwest as already referred to the creche has been positioned to protect the residential amenity of the existing dwelling which back onto the lands here. The creche is designed with no windows at first floor overlooking the rear gardens of these dwellings and has been positioned so that there is no impact on the existing trees along the boundary to the south of the creche.

Carparking throughout the scheme is a mix of on curtilage parking along with shared parking to the terraced and semi-detached houses. For the duplex blocks and apartments all parking is shared to maximise efficient use. Bicycle parking is provided for each of the apartments in the form of internal storage and for the duplexes in the from of covered external spaces. Bin stores are included in the development both for mid terraced houses, where they are integrated into the front garden boundaries where possible and in shared arrangement for the duplex units. In the apartments an internal bin storage area is provided.

## 12.7 Potential Impacts

The methodology for the assessment of the impacts of the proposed development on the landscape is based on terminology given in the '*Guidelines on the Information to be contained in Environment Impact Assessment Reports' August 2017, EPA*

The potential visual and landscape impacts are assessed from within the context of the visual envelope of the site or the Zone of Visual Influence. That is to say the landscape general extents from which the site is visible and significant in terms of the type and scale of development proposed. This is, to a large extent, determined by the general topography and the vegetative covering layer over the topography together with proximity to the site. In the case of this visual and landscape assessment, due to the terrain and the extensive woodland cover, a series of key viewpoints were identified and agreed with Cork City Council. To assess the impact of the proposed development on the landscape, photomontages of the proposed development have been generated from each of these eight key viewpoint locations, as presented in Appendix 12.1 (EIAR, Volume 3).

| **POTENTIAL IMPACTS** | |
|---|---|
| **LANDSCAPE SENSITITY** | |
| Degree of Sensitivity | Parameters |
| High | Has strong positive overall character containing valuable elements with a high sensitivity to change. |
| Medium | Has positive general character or elements with some compromise due to former or current usage with sensitivity to further change |
| Low | Has a neutral to negative character, little or no valued elements where change may be valued |
| **LANDSCAPE SIGNIFICANCE** | |
| **Degree of Impact** | |
| Imperceptible | Measurable yet without noticeable consequence, essentially remaining the same |
| Slight | Noticeable change without change to the landscape sensitivity |
| Moderate | Alters character of landscape at a level that is noticeable in a portion of the view. |
| Significant | Alters the character of a sensitive view, change encroaches to become the dominant feature |
| Profound | Utterly changes the sensitive characteristics through removal, obstruction or alteration |
| | |
| Impact Type | |
| Neutral | Creates change but does not affect the quality of the environment. |
| Positive | Creates change that contributes to the quality of the environment |
| Negative | Creates change that degrades the quality of the environment |
| | |
| Duration of Impact | Duration |
| Temporary | Present less than or equal to 1 year |
| Short Term | Present from 1 to 7 years |
| Medium Term | Present from 7 to 15 years |
| Long Term | Present from 15 to 60 years |
| Permanent | Present from 60 years onwards |

**Table 12.1: Impact Definition**

### 12.7.1 Do Nothing Scenario

In a do-nothing scenario the development site would likely continue temporarily as lightly grazed meadows and scrub woodland. The proposed site is, however, was zoned by Cork County Council for residential development and it is inevitable that a development similar in nature to what is currently proposed will be permitted and constructed.

### 12.7.2 Visual Impact

We are informed by previous sections of this assessment that the site does not have a high degree of landscape sensitivity. The development site is positioned on a plateau area on the edge of the existing Kilbarry suburban district. Existing adjoining land uses are industrial, active sports and agricultural. There are a few existing individual dwellings and a small estate at a distance with views towards the site. There are no natural heritage areas within sight or special protection areas. The city limits and metropolitan greenbelt sit to the north with the undeveloped zoned lands surrounding the site set to have industrial development together with a proposed northern distributor route currently at a design stage. This is proposed to sweep from within the industrial zoned lands to the east across the valley north east of the site before turning west and running north of the site to connect with the Old Whitechurch and Old Mallow Roads and proceed further west. The lower site forms part of an open space zoning and this reserves further significant area up the valley to ultimately form a 21.3Ha. This will become a significant park for passive recreational at the edge of the city.

We also see that Cork County Council through their zonings have identified the critical landscape features and areas in the environs and afforded these areas protection to ensure that the integrity of the landscape is conserved. The high Landscape value and sensitivity relates mainly to the conservation of the landscape within the visual field of the Lee Valley together with the upper and lower harbour areas where the retention of vegetation on the valley walls and ridges and the river and harbour waterscapes are prioritised. The city in its plans identifies views and prospects around the city generally and these do not include this site or the Kilbarry environs generally. The lands immediately to the north are designated as metropolitan greenbelt and the wooded Glenamought River Valley in general and to the west in particular is recognised as a high value landscape.

While on plan it appears that the site area is situated in an area potentially exposed to views from all sides tree lines, hedgerows, hills and ridges beyond the site restrict site exposure. The site area is generally not fully exposed from any identified viewpoint except perhaps from the Old Whitechurch Road on approach to the city.


**Figure 12.3: Location Plan showing agreed viewpoint locations for photomontage images 1-9.**

**Viewpoint 01: DWELLING T23WH21, OLD WHITECHURCH ROAD, Appendix 12.1 (EIAR, Volume 3)**


*Existing Image:*

This viewpoint location is from the Old Whitechurch Road north of the development site approximately 0.53km from the northern edge of the residentially zoned area of the site. This is an approach road to the city from Whitechurch Village and at this point is within the city boundary and the metropolitan greenbelt skirting the northern edge of the city built up and zoned areas. At present this is a country road. The rear

of a large structure within the Kilbarry Business Park is in view. To the right and on the high ground to the left the trees screening on the west side of the Delaney's main pitch is visible.


*Proposed Image:*

The view from this location changes dramatically with the proposed development occupying the entire upper area. The apartment buildings along the northern edge and the housing further south are visible as this viewpoint is also at a high elevation, we view right across the plateau space in the existing image. While the change is significant the new development addresses this view point as a coherent townscape and the apartment buildings look well on the edge of the valley wall. Vegetation along the Old Whitechurch Road reduces the exposure of the development to some extent. In general the development sits comfortably into the landscape. Due to the need to maintain the upper meadows for pollinators tree landscaping along this edge of the development is restricted to avoid overshadowing the field layer vegetation to maintain the current species mix.

**Viewpoint 02: BRIDGE HOUSE T23 E893, OLD WHITECHURCH ROAD, Appendix 12.1 (EIAR, Volume 3)**


*Existing Image:*

This viewpoint location is from the Old Whitechurch Road north of the development site approximately 0.23km from the northern edge of the residentially zoned area of the site. This is an approach road to the city from Whitechurch Village and at this point is exiting the greenbelt and dropping down to the Glenamought Bridge where it enters into the Kilbarry suburban area. At present this remains a country road with good hedgerow vegetation and woodland visible ahead and to the left on the north facing valley wall. No development is visible and only some wirescape breaks the horizon line. The treelines around Delaney's grounds are not visible.

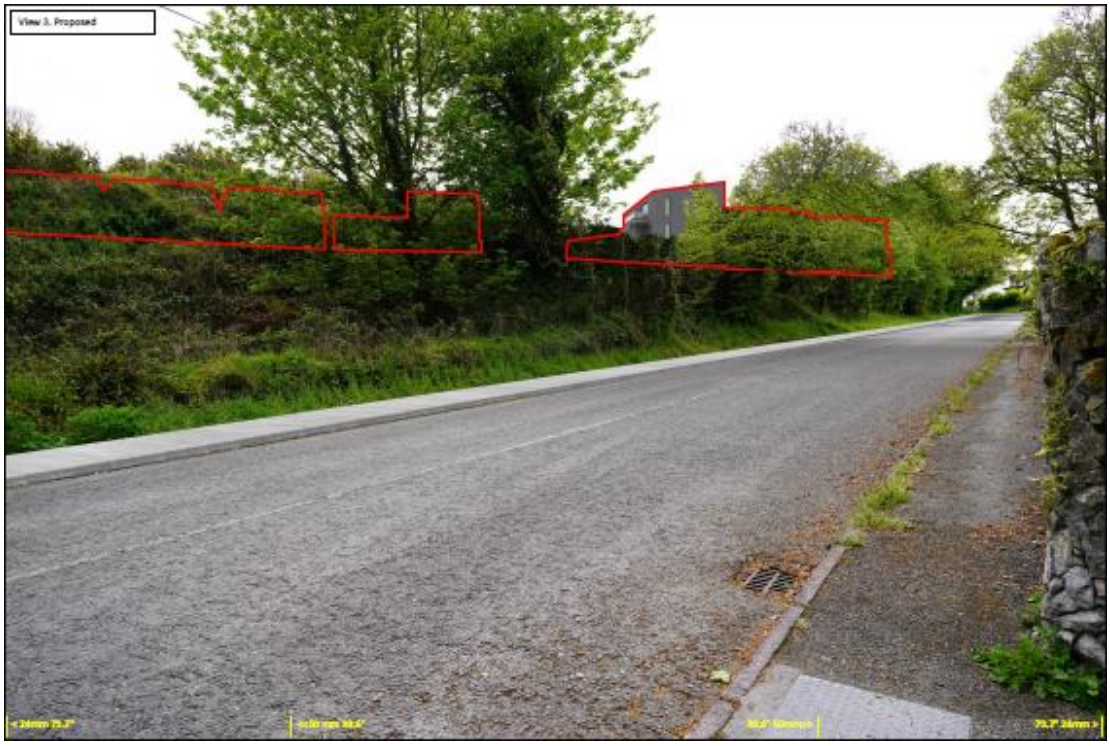

*Proposed Image:*

The view from this location changes dramatically with the proposed development occupying the entire upper area above the horizon line seen in the existing image. The apartment buildings along the northern edge present well from this view point. Less housing is visible on the plateau south of the apartments as the elevation of this viewpoint limits visibility to upper floors and roofscape. At this closer location more detail is visible and the sub-division of the development overall in to character areas is apparent with contemporary elevational treatment to the apartment and the adjoining housing neighbourhood. To the west the elevations have contrasting brick finishes. The retention of the north facing valley wall as open space is also evident from this location and gives the development above an attractive landscape setting. While the change is significant the new development addresses this view point as a coherent townscape and the apartment buildings look well on the edge of the valley wall. Vegetation along the Old Whitechurch Road reduces the exposure of the development to some extent. In general, the development sits comfortably into the landscape. Due to the need to maintain the upper meadows for pollinators tree landscaping with trees along this edge of the development is restricted to avoid overshadowing the field layer vegetation to avoid biodiversity loss.

**Viewpoint 03: T23HY01 T23, OLD WHITECHURCH ROAD, Appendix 12.1 (EIAR, Volume 3)**

*Existing Image:*

This viewpoint location is from the Old Whitechurch Road where it reaches the road frontage of the development site on the west side. This is a location within the Kilbarry built-up/zoned area and there is a footpath along the west side of the road. The roadway is climbing uphill from the Glenamought Bridge and the viewpoint is still within the narrow valley terrain and it well wooded on both sides of the road. The site road frontage is sloping down to the roadway sharply. The field of vision is very restricted.




*Proposed Image:*

The view from this location does not change significantly. The corridor of vegetation running east to west, straddling the River Glenamought has been largely maintained. A foot path is proposed on the eastern side of the road and there has been some removal of trees to allow for this. The development remains concealed.

**Viewpoint 04: EXISTING SITE ENTRANCE, OLD WHITECHURCH ROAD, Appendix 12.1 (EIAR, Volume3)**

*Existing Image:*

This viewpoint location looks directly east into the existing entrance to the development area from the Old Whitechurch Road. There are dwellings fronting onto the west side of the road behind this viewpoint with a footpath in place. The eastern side of the road has individual dwellings above the road well concealed with screen hedging. There is a considerable amount of vegetation and immature trees lining the left side of the entrance laneway. These conceal a disused workshop structure and associated derelict outbuildings.


*Proposed Image:*

The view from this location changes dramatically with the proposed development. A road junction replaces the laneway to provide a through road for vehicles and public transport together with bicycle lanes on both sides. from the Old Whitechurch Road to Upper Dublin Hill. This road will set the proposed new dwellings and apartment buildings back from the existing dwelling and a setback also occurs along the road frontage to distance the development from existing dwellings fronting towards the site. Having been setback from existing neighbours the proposed development addresses the entrance and the Old Whitechurch Road with attractive elevations and good massing to form an entrance to the development, giving a sense of entrance to the Cork City at this appropriate point on the Old Whitechurch road to the city.

**Viewpoint 05: KILNAP BRIDGE, OLD MALLOW ROAD, Appendix 12.1 (EIAR, Volume 3)**

*Existing Image:*

This image is taken from the Kilnap Bridge on the Old Mallow Road at a distance of 0.5km from the north western corner of the site. The view looks south east up the Glenamought Valley which is well wooded. A horizon line is visible to the right but this is the north facing valley wall at close quarters to the viewpoint location.


*Proposed Image:*

In the proposed image we see that the proposed development is not visible from this location and the outline indicates that were it visible it is of a scale from this location and would not have a significant impact. It may be visible to some extent in the winter months when the leaf canopy has been lost. The Kilnap Viaduct is behind this viewpoint location and the railway line is at a higher elevation. It is therefore likely that the development would be visible to railway passengers. The general views inbound from the railway corridor in other directions also look out to a cityscape on the western side of the tracks.

**Viewpoint 06: ROSEMOUNT ESTATE, Appendix 12.1 (EIAR, Volume 3)**

*Existing Image:*

This viewpoint location is from the cul de sac within the Rosemount Estate. The view looks toward the development site which is 0.6km to the south west across the valley, on the plateau area above the river. At present the pylons and overhead powerlines dominate the scene in a line directly towards Rosemount from the corner of the site in front of the Delaney's Main Pitch. The more distant urban area of Farranree is visible via the valley corridor that opens into the Bride River valley and the Blackpool area of the city. The north facing valley wall of the Glenamought lifts the scrub woodland into view and is attractive and quite significant from this location. The plateau area which is residentially zoned is not visible as this viewpoint is from a lower elevation.


*Proposed Image:*

The view from this location changes dramatically with the proposed development occupying the entire area above the horizon line in the existing view. The overhead power lines and associated pylons are still dominant. The development presents a cohesive frontage out to the valley and its impact is reduced with the three character area elevational treatments subdividing the overall mass. The continuity of the proposed development along the valley to the west also creates a sense of continuity with the proposed development linking with more distant parts of the city seen in the existing image. The apartment structures become a focal point and successfully address the valley and lookout over the open space area below. The open space areas below the proposed development look much the same as they do in the existing image and actual become more apparent with the landscape seeming more significant with the urban edge above on the plateau.

**Viewpoint 07: DELANEY'S HURLING & FOOTBALL CLUB, Appendix 12.1 (EIAR, Volume 3)**

*Existing Image:*

This viewpoint is from within the existing car parking area of Delaney's Hurling and Football Club Grounds. This is a large expanse of tarmac with no line marking to visually organise parking or circulation. The backdrop to this is a continuous line of palisade security fencing together with an array of sponsorship advertising. Beyond the fence there is scrub vegetation of willow and gorse. Beyond that the sky dominates the scene. At present this view looks uninviting.


*Proposed Image:*

The view from this location changes dramatically with the proposed development occupying the entire area beyond the security fence. The larger scale apartment buildings along the northern edge of the development are not visible. Two storey dwellings are visible and present mostly front elevations towards the sports grounds. This introduces passive surveillance over the sports grounds and will make the existing car park environment more inviting to users.

**Viewpoint 08: CARIG COURT, UPPER DUBLIN HILL, Appendix 12.1 (EIAR, Volume 3)**

*Existing Image:*

This image is taken from the junction from the Upper Dublin Hill Road in to the Carig Court residential development at a distance of 0.57km from the north east corner of the residential development site. The view looks west towards the development area. The road edge in the foreground is an embankment and has a treeline broken at this viewpoint location. These features prevent views out over the general plateau area south of the Glenamought River.

*Proposed Image:*

In the proposed image we see that the proposed development is not visible from this location and the outline indicates that were it visible it is of a scale from this location and would not have a significant impact. This view will not change seasonally as the development lies below the horizon line with a rise in the plateau contours between the site and this section of Upper Dublin Hill.

**Viewpoint 09: BLACKMANS BAR, UPPER DUBLIN HILL, Appendix 12.1 (EIAR, Volume 3)**

*Existing Image:*

This image is taken from the in front of Blackmans Bar on the Upper Dublin Hill Road 0.67km from the north east corner of the residential development site. The view looks west towards the development area. The road edge in the foreground is a low retaining wall which does not obstruct views out over a flat field area. Some screen vegetation occupies the left of the image around an existing dwelling. These features and a hedgerow at the west side of the field prevent views out over the general plateau area south of the Glenamought River.


*Proposed Image:*

In the proposed image we see that the proposed development is generally not visible from this location and In a gap it is possible to see a small section of the proposed development in a gap between the shrub trees on the hedgerow at the western side of the field. In general, the development outline indicates that were it visible it is of a scale from this location and would not have a significant impact. This view will change to a very slight extent seasonally as the development the hedgerow is dense and will continue to conceal the distant structures and roofscape with a rise in the plateau contours between the site and this section of Upper Dublin Hill.

### 12.7.3 Impacts on adjacent dwellings

There are a range of existing dwellings in particular the 4no. dwelling backing on to the site and a number of dwellings fronting towards the western edge of the site all on the Old Whitechurch Road. These dwellings where there is no adequate screen fencing or vegetation will be impacted negatively by the proposed development. The dwellings fronting the development site road frontage will also be impacted upon negatively as they will lose the current outlook on to a rural hedgerow. The Mill Building is below the site and has no visual connection to the residential development area and will not be impacted upon. Other dwellings will be impacted slightly and to a reducing extent as the distance between the site and their locations extends. In most situations these dwellings do not front toward the development site but the Old Whitechurch Road.

### 12.7.4 Impacts from other locations

Other locations are too distant from this site to be impacted upon. The site is well concealed to the east and south and has limited exposure to parts of Farranree Upper 1.5km to the west. These areas already look across the Bride Valley onto industrial and commercial development that is more prominent and closer to that viewpoint location.

### 12.7.5 Construction Impacts

The timeframe for construction of the development will be over a five-year period and therefore it will have differing impacts at different times during that period, dependent on what is under construction and how much of it at any given time. The early phases will see the more prominent locations on the western and northern sides of the site developed first and the work in this area will create temporary impacts. These road and earth remodelling works will attract attention and increase the visual disturbance experienced, resulting in a moderate, negative, temporary impact.

These early works will involve the formation of the entrance to the development site from the Old Whitechurch Road, a new link to the Upper Dublin Hill Road together with the access into the Phase 1 area. Once these works are implemented, however, mitigation measures will reinstate turf, shrub and tree vegetation and the landscaping and proposed townscape will be put in place and the parkland proposed on the open space area will largely retain the existing vegetation of scrub trees and meadows in place as existing.

## 12.8 Proposed Mitigation Measures

As with all development and in particular the development of greenfield sites, impacts are inevitable. From the outset of the design process mitigation has been considered in order to minimise the potential negative impact the proposed development may have on the Kilbarry environs and in particular impacts from the selected viewpoint locations. Appendix 12.1 (EIAR, Volume 3).

Impact on the existing dwellings backing on to the western boundary is mitigated with the location of a Creche on that boundary with no overlooking from first floor level. Appropriate noise abatement fencing and landscaping will be in place. The remaining rear gardens will back onto landscaped open space along the west side of the proposed new road linking the Old Whitechurch Road with the Upper Dublin Hill Road, which will ensure the protection of the existing trees in this area.

Mitigation will be in place along the southern boundary of the site bounding with the Kilbarry Business Park in the form of an avenue of trees that will augment and infill gaps in the boundary landscaping already in place within the Park. This will in time improve the view from southern areas of the city helping to provide a deeper vegetative backdrop for the existing commercial structures on the hillside location.

The development will by overlooking Delaney's GAA Club improve the sense of security for its users. The link Road passing south of Delaney's will make the premises more accessible and safer for pedestrian and cyclists and public transport as well as private vehicles. The road link will make the Club Grounds less isolated than at present and give it a more public entrance point, and will integrate the facilities better into the surrounding area.

The development on the northside of the plateau is designed to present a continuous frontage looking north out towards the valley and onwards over the metropolitan greenbelt beyond. In so doing the edge of the city at this location is well designed and defined. The development is fully exposed along this edge and the mass and scale of the new neighbourhood is broken down into three distinct character areas. The apartment buildings are designed as a focal point in the landscape. The scale and position of the apartment structures is designed to mitigate for the lack of passive surveillance over the zoned open space area below the residential area; smaller scale less obtrusive structures if put in place along this edge would not provide any passive surveillance to the meadows and trails proposed to circulate through and around the park area proposed below.

Of less scale the road frontage to the Old Whitechurch Road gives a good entrance to the development and a good urban frontage to the Old Whitechurch Road. The development is setback from the existing and proposed new link road edges to mitigate for the impact on existing dwellings presenting variously a side elevation and front elevations toward the new development.

Impact on bio-diversity is mitigated with the retention of as much existing vegetation as possible in particular in the area zoned as public open space. Existing fragile pollinator meadow habitats are to be enclosed with fencing and defensive hedging with appropriate management and maintenance procedures to be adopted. Further meadow areas are to be retained and enriched to extend the habitat value within the park. The wet meadow on the rivers edge will be retained as existing without formal path routes proposed to access this area. The existing scrub woodland and significant trees will be where ever possible

retained. Bicycle and pedestrian trails are proposed to enable access through and around the park area to the public for recreational use in a managed way minimising impact on the existing habitats.

Rainfall runoff is proposed to be attenuated appropriately and a dry cobble stream route will be constructed from the pipe outfall through the woodland scrub and wet meadow to the existing river Glenamought below the development to minimise impact on trees and habitat.

## 12.9 Residual Impacts

Cork is an expanding city and the proposed zoned development lands at Kilbarry are in the vicinity of a range of other existing urban land uses and lands zoned for residential and commercial developments. The construction of a residential development will therefore infill, a gap at the edge of the city resulting in a new residential neighbourhood in the townscape already in place with proposed park, existing sporting amenities and employment opportunities within a short distance allows for sustainable transport choices for future residents. The site urban fringe location overlooking a future 21.3Ha Public Park and biodiversity corridor with an outlook to the metropolitan greenbelt.

With mitigation strategies in place, the development once completed will generally result in neutral to slight negative impact, the negative impacts arising are due primarily to the change from open pasture lands to a residential neighbourhood. The development overall will not have any significant or profound residual landscape or visual impacts except on the individual property dwellings at close proximity accustomed to a rural outlook. The design of the proposed development has, however, mitigated the extent of impacts where ever possible. These dwellings are surrounded by or overlook lands zoned for change from agricultural to residential and commercial use. It is therefore an inevitability that they too become integral elements in the expanded townscape.

The Kilbarry development will become a permanent element on the urban edge of Cork City and the proposed building front out toward the park area with excellent elevational treatments and with sub-division into character areas to reduce the overall volume of development. The visual impact of the proposed development will be permanent as the open space landscape in existence in the valley below the housing is to be conserved as existing to protect biodiversity. This involves avoiding overshadowing of the existing meadow areas therefore, it is a requirement to minimise the amount of tree planting along the northern edge of the residential area. The proposed buildings will therefore not become more screened by maturing trees in the future.

## 12.10 Worst Case Scenario

In the worst-case scenario, a development could be halted before it completes, as was seen for some developments during the 2008 economic downturn. In such a 'Ghost Estate' situation ground works and indeed structures could be partially complete and begin to look progressively unsightly for a period of time until the economy recovers. The phasing of the development has the areas more exposed to external viewpoints earmarked for early completion and this will minimise the potential for incomplete site development work and building construction.

## 12.11 References

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## 13.0 LAND, SOILS & GEOLOGY

**Content** **Page**



**Figures, Tables, Appendices**

## 13.1 Introduction

### 13.1.1 Chapter Author

This chapter has been prepared by Deirdre O'Hara. Deirdre O'Hara is a Senior Geotechnical Engineer with over 24 years' experience in geotechnics from project inception to post construction stage. Working from the Castlebar Office, Deirdre is currently team leader for the geotechnical requirements of the Dublin, Cork and Castlebar offices, undertaking design and project management of large site investigation contracts and following through with this information to design earthworks for large infrastructure projects, including roads, bridges, railways, flood alleviation, water and wastewater pipelines and treatment plants and motorway service areas.

### 13.1.2 Chapter Context

This chapter presents the findings of an impact assessment of the proposed development on the soils, geology and hydrogeology at the proposed Strategic Housing Development (SHD) located at Kilbarry, Cork, hereafter referred to as the proposed development. A detailed description of the proposed development is outlined and presented in Chapter 4: Project Description.

The objectives of this assessment are:

- To review and characterise the baseline soils and geological conditions of the existing environment within the study area.
- To evaluate the impact of the design for the project on these attributes and establish the activities associated with the construction and operation of the proposed development.
- To address interactions with other disciplines.
- To identify and assess any potential impacts on any geological heritage sites or sites of geological interest.
- To identify and incorporate appropriate mitigation measures, that would prevent, reduce, or remediate the identified impact.
- To conclude any residual impacts that would remain or arise from the mitigation measures identified.

## 13.2 Methodology

The assessment had been undertaken in accordance with the 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Schemes' (National Roads Authority (now TII), 2009). It also has regard to the Environmental Protection Agency (EPA), Institute of Geologists of Ireland (IGI) and European Commission environmental impact assessment guidance:

- EPA (2015) 'Advice Notes for Preparing Environmental Impact Statements Draft'
- EPA (2022) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'
- IGI (2013) 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'

- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Road Authority (NRA) 2008)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)

### 13.2.1 Legislative Context

The EIA Directive 2014/52/EU amends the previous EIA Directive (2011/29/EU) and is designed to ensure that projects likely to have a significant effect on the environment are subject to a comprehensive assessment of environmental effects prior to development consent being given.

On a national level the EIA Directive has been transposed into Irish legislation by The Planning and Development Regulations 2001 (S.I.No.600/2001), which outlines the types of project for which mandatory EIA is required. Under Schedule 7 of the Planning and Development Act and Annex III of the EIA Directive, the environmental sensitivity of geographical areas likely to be affected by projects must be considered.

### 13.2.2 Impact Evaluation Methodology

According to Schedule 6 of the 'Planning and Development Regulations, 2001, as amended' a description of the aspects of the environment likely to be significantly affected by the proposed development is required on '*soil, water, air, climatic factors and the landscape*'.
Impacts may be categorized as one of three types:

- Direct Impact - the existing hydrological environment along or in close proximity to the route corridor is altered, in whole or in part, as a consequence of construction and/or operation.
- Indirect Impact - the hydrological environment beyond the proposed route corridors is altered by activities related to construction and/or operation.
- No Predicted Impact - the proposed route corridor has neither a negative nor a positive impact on the geological, hydrological or hydrogeological environment.

The rating criteria for assessing the importance of geological and hydrogeological features within the study area are described in the NRA Guidelines.

The rating criteria for quantifying the magnitude of impacts are in accordance with impact assessment criteria provided in the EPA Guidelines and the IGI Guidelines. The criteria apply to potential impacts during both the construction and operational phases.

## 13.3 Consultation

A number of statutory and non-statutory consultees were contacted to ascertain any commentary or observations in relation to the project, including:

- Geological Survey Ireland
- An Taisce;
- Inland Fisheries Ireland;

- Transport Infrastructure Ireland;
- The Heritage Council;
- The HSE, and
- Department of the Environment, Climate and Communications.

### 13.4 Existing Environment from Baseline Studies

The primary study area for the purpose of this assessment covers a 2 km zone beyond the boundary of the proposed development, in accordance with the IGI Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (2013), taking account potentially significant impacts which could arise at a greater distance away. Various data sources have been consulted throughout the course of this assessment. These include:

- GSI Spatial Viewer (https://dcenr.maps.arcgis.com) for information on soils, geology and hydrogeology
- Irish Geological Heritage Programme of the GSI (https://www.gsi.ie/en-ie/programmes-and-projects/geoheritage/Pages/default.aspx)
- Ordnance Survey of Ireland online historic mapping and aerial photographs GeoHive (https://www.map.geohive.ie);
- Teagasc and the Environmental Protection Agency Irish Soil Information System (http://gis.teagasc.ie/soils/index.php);
- Historic Mine Sites – Inventory and Risk Classification (EPA & GSI)
- Cork City Council (CCC) (Extent of the public water supply schemes within the study area, Extractive Industries Register) (https://www.epa.ie/our-services/compliance--enforcement/waste/extractive-industries-register/)
- The Office of Public Works (OPW) (www.opw.ie)
- Environmental Protection Agency (EPA) (https://gis.epa.ie)
- National Parks & Wildlife Service (http://www.npws.ie/);
- The Cork City Development Plan 2022-2028

A ground investigation, comprising cable percussion boreholes, trial pitting, in situ testing including standard penetration tests and hand vane tests, and laboratory testing, was carried out by Priority Geotechnical Limited (PGL) at the site between 07th August and 13th September 2019. Geotechnical laboratory testing of selected samples collected during these works was carried out to determine soil properties and strength parameters. A subsequent series of soakaway tests were carried out by PGL between 29th January and 01st February 2021. Findings are presented in the Factual Reports produced by the Ground Investigation contractor which are included in Appendix 13.2. A Malachy Walsh & Partners Report on the ground conditions at Kilbarry (2005) is included in Appendix 13.3.

#### 13.4.1 Overview

The proposed development consists of the construction of 319 no. residential units (85no. semi-detached houses, 118no. terraced houses, 53no. duplex apartments and 63no. apartments), a creche, a riverside amenity park, and all associated ancillary works on a circa 15.52ha site located at Kilbarry, in the administrative jurisdiction of Cork City Council. Demolition of a disused hurley manufacturing factory and associated out

buildings is also planned. The site is bound to the north by the valley formed by the Glennamought River, a tributary to the River Bride, which is itself a tributary to the River Lee. The east of the site is bound by the pitches and club house of Delaney's GAA club, and by a road and domestic buildings to the west. A business park is located to the south of the site. The site is adjacent to the Delaney's GAA Club and is currently disused.

### 13.4.2 Quaternary Geology

Quaternary Geology are superficial deposits of quaternary-aged material that overlie the bedrock geology of the site.

### 13.4.3 Soils

The majority of the study area is characterised by well drained shallow and deep (mainly acidic) mineral soils described as fine loamy drift, with an area of shallow, rocky, peaty/non-peaty mineral complexes (mainly acidic). The Irish Soil Information System indicates these soils belong to the Clonroche Soil Association which is considered a high fertility soil.

### 13.4.4 Subsoils

A review of the GSI Quaternary Geology datasets (Figure 13.1 Quaternary Geology) indicates that the north-western section of the proposed development has rock at surface, although a Quaternary meltwater channel is identified in the geomorphology layer which is present at the northern boundary of the site. The south-eastern portion of the site is underlain by glacial till, derived from Devonian sandstones, with thicknesses between 0.20 m and ≥2.70 m.

### 13.4.5 Agricultural Soils

The CORINE 2018 landcover for the site (Figure 13.2 Corine 2018 Land Cover) indicates the area is primarily unclassified, with small areas underlain by Artificial Surfaces (CORINE 2018 code: 121) and Agricultural Areas (CORINE 2018 code: 211) in the west and east of the site respectively.

### 13.4.6 Geology

The GSI Bedrock Geology datasets identifies the bedrock geology underlying the proposed development site as the Ballytrasna Formation; 'dusky-red to purple mudstones with subordinate pale-red sandstones, with significant quartz-pebbly sandstones in some localities'. 'Weathered Shale' and 'Siltstone and Sandstone' suspected bedrock was encountered during several trial pit excavations at depths between 0.7 m and 3.9 m. Bedrock excavation will be required at this site.

The bedrock geology is shown in the "Bedrock Geology Drawings" (Figure 13.3 Bedrock Geology and licenced facilities).

### 13.4.7 Soft or Unstable Ground

Soft and/or unstable deposits consist of peat, alluvium, and soft cohesive materials. Soft deposits were not identified within the proposed development from a desktop assessment of the Quaternary Geology, but some areas of soft clay were identified within Made Ground during ground investigations (see **Contaminated Land**).

### 13.4.8 Mineral/Aggregate Resources

There are no mineral localities, metallic or non-metallic, within the proposed development. There are also no active quarries within the proposed development. The crushed rock aggregate potential underlying the proposed development is classified as predominantly high, with classifications varying from low to very high potential in the surrounding areas, as shown in Figure 13.4 Aggregate Potential.

### 13.4.9 Geological Heritage Areas

A review of GSI's County Geological Sites (CGSs) indicates there are no audited or unaudited CGSs within 2 km of the proposed development. There are four unaudited CGSs within 10km of the proposed development, all of which may be recommended as Geological Natural Heritage Areas (Table 13.1).

| County Geological Heritage Site | Details | Distance from Project |
|---|---|---|
| Blackrock Diamond Quarry | Amethyst; tarmac over – coal yard | 4.0 km |
| St Joseph's section on Lee Road | Transition to Carboniferous | 4.7 km |
| Rock Farm Quarry, Little Island | A series of limestone quarries in which the limestone is divided into three distinctive zones of the Visean (Lower Carboniferous). Provides the type section for the Cork Red Marble Fm on its western shore and forms the type section for the Little Island Fm. | 9.2 km |
| Little Island | Little Island provides the type section for the Cork Red Marble Formation | 9.5 km |

**Table** Error! No text of specified style in document.**3.1: Geological Heritage Sites.**

Note: The GSI produced a list of 16 Geological themes (IGH1-16) which assists in producing a list of sites for each theme. Themes are listed below:

1. Karst 2. Precambrian to Devonian Palaeontology 3. Carboniferous to Pliocene Palaeontology 4. Cambrian-Silurian 5. Precambrian 6. Mineralogy 7. Quaternary 8. Lower Carboniferous 9. Upper Carboniferous and Permian 10. Devonian 11. Igneous intrusions 12. Mesozoic and Cenozoic 13. Coastal geomorphology 14. Fluvial and lacustrine geomorphology 15. Economic geology 16. Hydrogeology

The Geoheritage sites outside the study area are not considered sensitive to the development due to their distance from the site boundaries and will not be discussed further.

### 13.4.10 Karst

No karst features were identified within 2 km of the proposed development, which is not underlain by limestone bedrock. The study area is underlain by bedrock which non karstifiable, therefore impacts associated with karstification have not been further considered in the assessment.

### 13.4.11 Contaminated Land

Ground investigation results were analysed by Verde Environmental Consultants Ltd., their findings on the made ground present at the site are included in Appendix 13.1.

There are four licensed facilities within 2 km of the proposed development which are currently in use as detailed below.

There are no waste licensed facilities within the study area, as shown in Figure 13.3 Bedrock Geology and licenced facilities). There are also no EPA licensed facilities or legacy landfills recorded within the study area. There are four EPA licensed facilities within 2 km of the proposed development, which are summarised in Table 13.2 below. All licensed facilities are considered sufficiently distant from the proposed development to have no impact. Therefore, impacts associated with these facilities have not been further considered in the assessment.

| License No. | License Type | Facility Name | Facility Type | Distance from Proposed Development |
|---|---|---|---|---|
| P0218-01 | IPC | Dulux Paints Ireland Limited | The manufacture of paints, varnishes, resins, inks, dyes, pigments or elastomers where the production capacity exceeds 1,000 litres per week | 800 m |
| P0251-01 | IPPC | Rothbury Manufacturing Limited | Dyeing, treatment and finishing of textiles when the capacity is greater than 1 ton | 815 m |
| W0257-01 | IEL | Country Clean Recycling Unlimited Company | Recycling and Waste Facility | 1730 m |
| W0147-01 | Waste | Ashgrove Recycling | Recycling and Waste Facility | 1890 m |

**Table 13.2: EPA Licenced Facilities within 2 km of the Proposed Development.**

### 13.4.12 Landslide Potential

A review of the GSI Landslide Susceptibility dataset indicates the landslide susceptibility varies from 'Low' to 'High' susceptibility within the proposed development (Figure 13.5 Landslide Susceptibility). Construction will occur on areas of 'Low' to 'Moderately Low' landslide susceptibility. The northwest portion of the site, which includes the areas of 'Moderately High' and 'High' landslide susceptibility, likely due to the steep slope to the Glennamought river along the northern boundary of the site, will be used primarily as green amenity spaces.

The GSI Landslide Events dataset does not identify any historic landslides in the vicinity of the proposed development. Therefore, Landslide Potential has not been considered further in this assessment.

### 13.4.13 Hydrogeology

Hydrogeology in the vicinity of the proposed development is assessed in greater detail in Chapter 14 Water.

### 13.4.14 Aquifer Classification

The GSI Groundwater Resources (Aquifers) dataset indicates the proposed development site is underlain entirely by 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones' (Figure 14.2). Aquifer classification is assessed in greater detail in Chapter 14 Water.

### 13.4.15 Groundwater Vulnerability

The GSI Groundwater Vulnerability dataset indicates the proposed development site is predominantly defined as having 'Extreme' vulnerability (including areas of 'Rock at or near Surface or Karst'), with a small area of 'High' vulnerability in the Southwest of the site Groundwater vulnerability is assessed in greater detail in Chapter 14 Water.

### 13.4.16 Summary of Geological Features Importance

The criteria for rating site importance of a geological feature is based on the Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes published by the NRA (2009) which is reproduced in the IGI guidelines. Initial assessment is based on the findings of the information listed above. These ratings are used to inform Table 13.3.

| Importance | Feature | Justification |
|---|---|---|
| High | High Fertility Soils | Attribute is a well-drained high fertility soil |
| Low | High Aggregate Potential | Attribute is an uneconomic extractable mineral resource |
| Low | Contaminated Land | Attribute is a small historical and/or recent landfill site for construction and demolition wastes |

**Table 13.3: Land & Soils Feature Importance within study area.**

## 13.5 Ground Investigation

An initial site specific Ground Investigation (GI) was carried out by Priority Geotechnical Limited (PGL) between 07th August and 13th September 2019, with a subsequent GI carried out by PGL between 29th January and 01st February 2021. The purpose of the GI was to provide detailed factual geotechnical information for the underlying ground conditions within the site. This information has been used to establish subsurface conditions at the site and to inform the geotechnical design and soils & geology, including hydrogeology for the route. A summary of the ground investigations carried out is provided in Table 13.4.

| Contractor | Description of Investigation | Details of Investigation |
|---|---|---|
| **Priority Geotechnical Limited** | Strategic housing development, Kilbarry, Co. Cork, Ground Investigation | 2 No. Cable Percussive Boreholes<br>25 No. Trial Pits<br>In-situ tests<br>▪ 9 No. Standard Penetration Tests<br>▪ 10 No. Hand Vane Tests<br>Laboratory tests<br>▪ 17 No. Natural Moisture Content tests<br>▪ 4 No. Atterberg Limits tests<br>▪ 15 No. Particle Size Distribution tests<br>▪ 1 No. MCV test<br>▪ 3 No. CBR tests<br>▪ 3 No. Proctor Compaction tests<br>▪ 10 No. pH tests<br>▪ 10 No. Sulphate tests<br>▪ 7 No. Total Sulphur tests<br>▪ 2 No. Organic Matter tests<br>▪ 6 No. LOI tests<br>▪ 5 No. Environmental analyses |
| **Priority Geotechnical Limited** | Strategic housing development, Kilbarry, Co. Cork, Ground Investigation – Additional Infiltration tests | 7 No. soakaway tests |

**Table 13.4: 2019 and 2021 Ground Investigation Summary.**

GI locations are illustrated in Figure 13.6. Results of the GI show that ground conditions are mainly typical and as expected for this region. They predominantly consist of Topsoil overlying Granular Glacial Tills, overlying Bedrock. However, the southeast region of the site also comprises a substantial volume of Made Ground, typically found below the Topsoil and above Glacial Tills.

Malachy Walsh and Partners previously identified an area of made ground within the site, in consideration of waste disposal; Lands at Kilbarry, Co. Cork. Response to Waste register No. WM55, 19/03, 24/03. 2004. This site investigation was also used to inform the Verde Environmental Consultants Ltd. Report on the made ground present at the site which is included in Appendix 13.1.

**Topsoil** was found in all the trial pits apart from TPIT01, TPIT02, TPIT03 and TPIT04, ranging in thickness from 0.10 to 0.60m, with an average thickness of 0.3m.

**Made Ground,** or Uncontrolled Fill, is defined as soil that has been altered in some way by human activity (imported and placed in-situ). Verde Environmental Consultants Ltd. Report on the made ground present at the site which is included in Appendix 13.1. Made Ground/fill was detected at several locations and comprises medium dense, brown, very sandy, very clayey GRAVEL with low cobble content and stiff brown, slightly sandy

gravelly SILT. Construction and demolition type material was encountered at some locations including timber, red brick, concrete, wire, metal, glass, clay piping etc. The made ground where encountered, was to depths ranging from 0.3mBGL up to 4.9mBGL (BH01). The photographic record contained in the factual report suggests that anthropogenic (man made) material is below 2% of total fill material.

Made ground/fill was underlain by mixed glacial deposits of brown, slightly sandy gravelly SILT with low cobble content to depths 0.7mBGL to 1.3mBGL overlying medium dense purple brown, silty sandy GRAVEL with medium cobble content and low boulder content to a depth 1.6mBGL to 3.1mBGL.

Made ground/fill was detected at the following locations (BH01, BH02, TP04, TP08, TP09, TP11, TP12, TP13, TP15, TP16, TP17, TP18, TP21 and TP23).

At locations, TP04, TP11, TP12 and TP13 the made ground/fill was less than 2.0m thick whereas borehole logs indicate greater thickness (2.0 to 4.0m) of made ground/fill at locations, TP08, TP09, TP15, TP16, TP17, TP18, TP21 and TP23.

**Granular Glacial Till** was encountered during the ground investigations at thicknesses ranging from 0.20 m to ≥2.70 m. The glacial deposits encountered comprise a highly variable, stratified mixture of cohesive and granular materials. The boundaries between these material types varies from sharp to gradational both laterally and vertically. A detailed review of the available ground investigation data for the site indicates that, although glacial deposits occur as either 'cohesive' or 'granular', they comprise a heterogenous mixture of materials.

PGL Site Investigations identified glacial deposits of purple-brown, slightly sandy silty GRAVEL to basal depths of 0.5 m to 3.9 m bgl. Initially having low cobble and boulder content, these appear to increase with depth. Sand is described as fine to coarse. Gravel is described as fine to coarse, angular to sub-rounded, including shales. Cobbles are up to 200mm in diameter, angular to subrounded, including shales. Boulders are up to 500mm in diameter, very angular to sub-rounded, including shales.

Where present, granular glacial till was generally encountered directly beneath topsoil or made ground and was underlain by weathered shale, possibly bedrock.

There was no cohesive glacial till identified at the site. During site investigations, some till was erroneously described as brown, slightly sandy gravelly SILT. Following review of PSD data, this unit has been reassigned as slightly sandy silty GRAVEL as described above.

**Bedrock** was possibly encountered at depths ranging from 0.7 m bgl to 3.9 m bgl, and in some places is at >4.9 m bgl. The suspected bedrock is predominantly described as weathered shale, and in one locality as broken purple siltstone and sandstone at a depth of 1.40 m bgl.

**Contaminated Land** is discussed in Verde Environmental Consultants Ltd. Report on the made ground present at the site which is included in Appendix 13.1.

**Organic Matter** was identified at low organic contents (<6%) within the glacial deposits during the PGL Site Investigation.

**Groundwater** was not encountered in the 2019 ground investigation trial pits or boreholes, which ranged from 0.7 to 4.9 m bgl. Groundwater was encountered in two trial pits during the 2021 ground investigation, at depths ranging from 1.1 m to 2.8 m bgl. Groundwater level readings are identified below in Table 13.5.

| TP ID | Groundwater Strike (metres below ground level) | Material | Stability remarks | Depth of excavation, m bgl |
|---|---|---|---|---|
| **TPIT06** | Trickle 1.1 m<br>Slow ingress 2.8 m | Granular Glacial Till | Moderate to poor | 3.0 |
| **TPIT07** | Trickle 1.3 m<br>Slow ingress 2.1 m | Granular Glacial Till | Poor | 3.0 |

**Table** Error! No text of specified style in document.**3.5: Groundwater level readings.**

Groundwater is further discussed in Chapter 14 Water.

## 13.6 Conceptual Site Model

| Unit | Material | Description | Depth to Top of Unit (m bgl) | Range of Unit Thickness (m) a) |
|---|---|---|---|---|
| 1 | Topsoil | Topsoil | 0.0 | 0.10 to 0.60 |
| 2 | Made Ground, as identified MF8 Layout Plans | Stiff, loose, brown, slightly sandy gravelly SILT with low cobble and boulder content, and C&D waste inclusions;<br>or<br>Purple-brown, sandy, very silty and clayey GRAVEL with low to medium cobble and boulder content, and occasional instances of C&D waste.<br>or<br>Soft, dark purple, gravelly sandy CLAY with large amounts of concrete, timber, plastic and tar. | 0.0 to 0.8<br>0.0 to 1.6<br>0.8 to 2.9 | 0.2 to 1.40<br>0.60 to ≥4.90<br>≥0.5 to ≥3.3 |
| 3 | Granular Glacial Till | Purple-brown, slightly sandy silty GRAVEL, with low to medium cobble content and low boulder content. | 0.3 to 3.1 | 0.20 to ≥2.70 |
| 4 | Bedrock | Typically weathered shale, or broken purple siltstone and sandstone. | 0.7 to 3.9 | Unproven |

**Table** Error! No text of specified style in document.**.6: Geotechnical Site Model. (*Note: a) The depths and unit thicknesses are based on borehole and trial pit locations and may not represent the maximum or minimum depths and thicknesses across the site).***

## 13.7 Predicted Impacts

### 13.7.1 Characteristics of the proposed development likely to result in significant effects on the land, soils & geological environment

The impact assessment is based on the Planning Stage Design for the Kilbarry SHD.

The Ground Investigation locations are identified in Figure 13.6 Layout with PGL localities & MWP Made Ground.

The development of the Kilbarry SHD will result in the following construction activities:

- Overburden and rock excavation
- Reuse and processing of site won material
- Foundations for structures
- Disturbance of soft soil
-

The proposed development will impact on the geological and hydrogeological environments through these activities. This is an unavoidable consequence.

These mechanisms of impact are discussed in the context of different causes of impact and in the context of sensitive receptors and attributes of importance (Refer Table 13.3).

**Causes of Impacts**

*Earthworks*
The cut and fill required to reach the line and levels required to achieve the required site layout will result in the excavation of high fertility soils, rock of a high aggregate potential and the removal or re-use of construction and demolition waste.

*Excavation of Soft Soils*
Soft clays were identified within the Made Ground in trial pits excavated on the site. The bulk of these soft subsoils will remain in place and will be piled or ground improvement techniques employed to support proposed roads and structures in this area. Other soft soil deposits not encountered in the site investigation underlying the proposed development will require excavation and replacement with suitable fill materials.

### 13.7.2 Do nothing

In the event that the proposed development does not progress, there will be no impacts on soils and geology. However, given its location within the development zoning of Cork City it is unlikely that the land will remain undeveloped in the long term, in accordance with national and regional policies to promote sustainable growth, such future developments would likely have similar impacts to those addressed above.

### 13.7.3 Construction Stage Impacts

**Geology**

*Overburden Removal*

Excavation work to remove subsoil and rock at the site of the proposed development, in order to facilitate site levelling, construction of foundations, and installation of underground services, is a direct and permanent impact on Soils and Geology. The volume of material to be excavated has been detailed in Table 13.7 below.

Whilst every effort will be made to minimise the requirement for the importation of material and to maximise the reusability of materials within the site, it is expected that a portion of this material will be removed from site for appropriate offsite reuse, recovery, recycling and / or disposal. However, the soil to be excavated is a mix of made ground and granular glacial till and of low commercial value. The effect on Land and Soils is likely to be short-term, significant and negative, but following appropriate mitigation measures, this potential impact is considered imperceptible (NRA 2008) and would be classified under the EPA guidelines as having an irreversible neutral effect, of imperceptible significance and permanent duration (EPA, 2022).

Proposed subsoil and rock excavation and backfilling works will also result in slight changes to the local topography in some areas of the site. Due to the limited impact on the overall topographical character of the area, this work will have an imperceptible, neutral effect, of permanent duration (EPA, 2022).

| Cut | Volume | Fill | Volume |
|---|---|---|---|
| Total cut required to develop the site incl.<br>Topsoil Cut<br>Rock Cut | 53,615m³<br>19,230m³<br>1,883m³ | Total fill required to develop the site incl.<br>Topsoil required on site | 35,544 m<br>9,615m³ |
| Total material to be disposed off site incl. topsoil | 18,071m³<br>9,615m³ | Fill required from cut | 25,929m³ |

**Table** Error! No text of specified style in document.**.7: Earthworks Volumes.**

**Economic Geology**

The presence of crushed rock with a high aggregate potential is considered to have a low impact No economic importance or heritage value is assigned to the interbedded mudstones and sandstones of the Ballytrasna Formation, which are not unusual geological units.

As the plan area of rock near the surface is low and the underlying geology indicates a mudstone/sandstone, it is unlikely that an economically viable quarry could be sited at this location. Rock excavation is required at this site, it is expected that the excavated rock will be used on site.

As such, sterilisation of the bedrock due to the proposed development is considered an imperceptible impact (NRA, 2008), and a neutral, imperceptible effect of permanent duration (EPA, 2022).

**Erosion, Storage & Stockpiles**

The removal of topsoil, overburden material and rock and the treatment of those materials shall require its temporary storage, handling, and reuse on site. The impact is classified as having a slight negative impact for a temporary duration (EPA, 2022) and a Moderate / Slight significance (NRA, 2008).

**Sealing of Overburden Material**

During construction, vehicles and plant will track over areas of topsoil and subsoil. The vehicle and plant movements have the potential to compact the subsoil (following topsoil removal). The magnitude of this potential impact is a negative effect, of imperceptible significance and of permanent duration.

**Soil Pollution**

During the construction phase, localised accidental spillages of fuel or chemicals on the site have the potential to contaminate the underlying soils by exposure, dewatering, or construction related spillages, resulting in a Permanent Negative Impact on soils. The magnitude of this impact is small adverse as it may result in the requirement to excavate/remediate a small proportion of contamination or result in a low risk of pollution to soils. As a result, its significance is Moderate / Slight for soil features.

**Groundwater Pollution**

The potential occurrence of suspended sediments in rainfall runoff from work areas would be a potentially brief to temporary negative impact (EPA, 2022), if the runoff were to migrate to the Glennamought River at the north bound of the site. Groundwater pollution is more extensively addressed in Chapter 14 Water.

**Soft Subsoil Conditions**

Deposits of soft soils underlying the proposed development will require excavation and replacement with suitable fill materials. Soft clays were identified within the Made Ground in a couple of the trial pits excavated on the site, resulting in poor ground conditions for building. These soft subsoils will remain in place and will be piled or ground improvement techniques employed. As such, the presence of soft subsoils on the site are considered to have a slight, negative effect of temporary duration (EPA, 2022).

**Topsoil removal**

The Clonroche Soil Association was identified at the site during the desk survey, they are described as a well drained high fertility soil. Given the relatively small area of land that could be developed agriculturally on the site due to the presence of rock near surface to the north of the site, the impact of excavating this material in order to facilitate site development and the associated removal of the site as potential agricultural land is considered an irreversible negative quality, of imperceptible significance of small extent and of permanent duration (EPA, 2022),

NRA (2008) guidelines designates well drained fertile soils as of high importance and of a small adverse magnitude, however the Cork City Development Plan 2022-2028 designates the land use at the site as 'ZO 1 Sustainable Residential Neighbourhoods' and 'ZO 15 Public Open Space'. The site is not designated for agricultural use which would amend the magnitude to negligible resulting in an overall imperceptible impact.

**Removal of Waste Material**

The presence of, and removal of, soil and fill material that have been identified as containing construction and demolition waste has been assessed under a human health risk, results of analysis have been compared against Generic Assessment Criteria (GACs) that have been developed for a wide range of parameters. The outcome of this comparison indicates that all recorded parameter levels are below relevant GACs. Results do not indicate an exposure risk to construction workers or future site users. Based on this analysis, the reuse of soil on-site as part of the development would not require specific remedial measures to mitigate exposure risk.

The further beneficial re-use of uncontaminated material is provided for in national legislation and the non-applicability of the waste management act in the case of uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated.

In terms of excavation of soil/fill material for transfer off-site, the previous investigation did not include for full waste classification only for waste acceptance criteria. Verde has been provided with laboratory certificates for the 5no samples and has completed a waste classification exercise using approved HazWasteOnline™ software. The outcome from this exercise confirmed material characterised by the five samples is non-hazardous and can be appropriated described under List of Waste Code, 17 05 04 (non-hazardous soil and stone).

Results have been compared against waste acceptance criteria as defined in Council Decision 2003/33/EC which prescribes waste acceptance criteria for various landfill types and this comparison confirms material would be acceptable at inert landfill facilities. Results are also compared with specific waste acceptance criteria and trigger values for soil waste recovery facilities as published by the EPA in 2020. This comparison indicates that majority of material would be acceptable at soil recovery facilities. Trace PAH was detected in one sample from TP12 which may be due to the decomposition of plant material associated with the top of an initial filling layer. Using all of the analysis available, outcome of classification exercise using HWOL and comparison against relevant acceptance criteria for landfill and soil recovery facilities, categories have been applied to the material. As expected, four of the samples are assigned as Category A material with a single Category B1 designation for the sample collected from TP12.

Trial pit logs and associated photographic evidence supplied in the PGL report indicate a generally clean, uncontaminated fill material that would be suitable for on-site reuse, subject to caveats listed below. Where material is to be excavated and transferred from the site, based on analysis to date, this material would be suitable for acceptance at an inert facility.

Whilst evidence provided by soil analysis to date indicates fill material is largely uncontaminated, this is based on 5no samples across the footprint of the site. Where it is contemplated that a significant volume of soil/fill material will require excavation and transfer from the site, additional sampling and analysis shall be required over the course of development works.

1. Where there is any doubt on material based on observations during excavations, additional testing should be undertaken.
2. Notwithstanding the findings of the Verde report (Appendix 13.1), it remains the responsibility of the groundwork Contractor to ensure that material is appropriately managed during the development. In particular, the Contractor will be responsible for the

appropriate segregation of excavated materials. The Contractor should retain a competent person to manage and supervise soil excavation and removal from the site. This person should ensure correct procedures are followed and that waste soils are appropriately logged and tracked using appropriate docketing system.

3. The appointed contractor for future groundworks will be expected to retain the services of an experienced environmental engineer or scientist during bulk excavation works, primarily to identify the depth of made ground and to identify any previously unidentified hotspots.
4. It is recommended that a Soil and Material Management Plan (SMMP) is produced by the appointed Contractor, to detail procedures to manage the excavation and removal of soil during construction works.
5. In recognition of national policy and sustainability, where material cannot be re-used as part of the on-site development works and requires transfer from the site, consideration should be given to the transfer of this material as a by-product under Article 27.

Should any waste material be encountered during construction, it will be removed to a suitably licensed facility. This would be considered to be a direct, permanent, Minor Beneficial (NRA, 2008) impact on soils by removing a potential source of contamination. Some localised pockets of Made Ground was encountered during the site investigation, with evidence of hydrocarbon contamination and C&D waste. It is anticipated that localised fill, containing inclusions of C&D waste can be left in place, resulting in a neutral effect of imperceptible significance and permanent duration (EPA, 2022).

### 13.7.4 Cumulative Construction Stage Impacts

If the proposed development is constructed and operated under worst case conditions there should be no additional negative impacts on soils and geology, provided that the mitigation measures described below are fully implemented.

### 13.7.5 Operational Stage Impacts

**Geology**

*Soil Pollution*

During the operational phase, there is a low risk of spillages of chemicals and fuels/lubricants, from an accident for example. As the site will predominantly be covered in hardstanding, the potential influx of any contaminants into soils will be minimised. The impact is neutral, of imperceptible significance and of permanent duration (EPA, 2022). The magnitude of this impact is considered direct, permanent and Negligible (NRA, 2008).

*Groundwater Pollution*

The potential impact of groundwater pollution is discussed in Chapter 14 Water but is considered imperceptible (EPA, 2022).

*Climate Change*

According to the IPCC (Intergovernmental Panel on Climate Change) temperature increase has already caused a sea level rise of 0.2m between 1901 and 2018 and it is very likely to virtually certain that sea levels will continue to rise throughout the 21st century (IPCC, 2021). Ireland will experience significant changes in rainfall characteristics and increased sea levels around the coast. Increased sea levels will increase the risk of coastal

flooding and higher water levels upstream in river estuaries. The impact on land, soils and geology during construction is considered to be negative, imperceptible and permanent (EPA, 2022) and low, permanent and negligible (NRA, 2008).

### 13.7.6 Cumulative Operation Stage Impacts

If the proposed development is constructed and operated under worst case conditions there should be no additional negative impacts on soils and geology, provided that the mitigation measures described below are fully implemented.

## 13.8 Mitigation Measures

### 13.8.1 Construction Stage Mitigation Measures

The recommended mitigation measures are based on the ground investigations carried out to date and are used to inform the geotechnical design for the site.

**Geology – Construction Stage**

*Overburden Removal*

Subsoils and bedrock removal is an unavoidable consequence of the construction works. The earthworks balance (refer Tables per Section) has been designed to maximise the reusability of excavated materials within the site.

The presence of, and removal of, soil and fill material that have been identified as containing construction and demolition waste has been assessed. Whilst evidence provided by soil analysis to date indicates fill material is largely uncontaminated, this is based on 5no samples across the footprint of the site. Where it is contemplated that a significant volume of soil/fill material will require excavation and transfer from the site, additional sampling and analysis shall be required over the course of development works.

1. Where there is any doubt on material based on observations during excavations, additional testing should be undertaken.
2. Notwithstanding the findings of the Verde report (Appendix 13.1), it remains the responsibility of the groundwork Contractor to ensure that material is appropriately managed during the development. In particular, the Contractor will be responsible for the appropriate segregation of excavated materials. The Contractor should retain a competent person to manage and supervise soil excavation and removal from the site. This person should ensure correct procedures are followed and that waste soils are appropriately logged and tracked using appropriate docketing system.
3. The appointed contractor for future groundworks will be expected to retain the services of an experienced environmental engineer or scientist during bulk excavation works, primarily to identify the depth of made ground and to identify any previously unidentified hotspots.
4. It is recommended that a Soil and Material Management Plan (SMMP) is produced by the appointed Contractor, to detail procedures to manage the excavation and removal of soil during construction works.

5. In recognition of national policy and sustainability, where material cannot be re-used as part of the on-site development works and requires transfer from the site, consideration should be given to the transfer of this material as a by-product under Article 27.

Where surplus soil cannot be reused it will be placed in the disposal areas set out in Chapter 15 Resource and Waste Management or removed off site for treatment, recycling, or disposal at an authorised waste management facility off site in accordance with the additional sampling and analysis required above.

*Economic Geology*

No mitigation measures are proposed

*Erosion of soils*

Topsoil stripping and earthworks removal will not be carried out over large areas in advance, which will limit the time for which these areas are exposed. Similarly, when the design cut level has been achieved, the slopes shall be battered back to a safe angle of repose and topsoiled immediately, the underlying material shall be protected by covering with construction materials or topsoil, as required, and shall not be left exposed. Control measures will involve the immediate use of topsoil wherever practicable after its stripping.

Following the implementation of these mitigation measures the residual impact is predicted to be imperceptible and neutral (EPA, 2022).

*Sealing of topsoil/overburden material*

The principal avoidance measures shall include the following; topsoil and overburden shall not be unnecessarily trafficked either before stripping or when in a stockpile. When the design cut level has been achieved, the underlying overburden shall be covered with construction materials or topsoil, as required, and shall not be left exposed.

Following the implementation of these mitigation measures the residual impact is predicted to be neutral Imperceptible.

**Geology – Operational Stage**

*Soil Pollution*

Mitigation measures proposed for soil pollution are consistent with the mitigation measures outlined in Chapter 14 Water for the protection of groundwater, as potential contaminants could travel through soil before entering the groundwater system. As such, measures to protect the groundwater also protect the soils from contamination.

*Climate Change – Operational Stage*

The impact on land, soils and geology during operational stage is considered to be negative, imperceptible and permanent (EPA, 2022) and low, permanent and negligible (NRA, 2008).

### 13.8.2 Predicted Residual Impacts

An overall analysis of the impacts, in the light of the proposed mitigation measures, concludes that all of the potential impacts (both during construction and operational stage) are predicted to be reduced to Neutral quality and Negligible magnitude.

*Geology*
No monitoring proposed

## 13.9 Interactions and Cumulative Effects

There are no ongoing projects or plans identified in proximity that have the potential to result in cumulative impacts with regard to Land, Soils and Geology.

## 13.10 Summary and Conclusions

The presence of, and removal of, soil and fill material that have been identified as containing construction and demolition waste has been assessed. Whilst evidence provided by soil analysis to date indicates fill material is largely uncontaminated, this is based on 5no samples across the footprint of the site. Where it is contemplated that a significant volume of soil/fill material will require excavation and transfer from the site, additional sampling and analysis shall be required over the course of development works.

## 13.11 References

Cork City Council, (2022). *Cork City Development Plan 2022-2028*.

Environmental Protection Agency (EPA), Institute of Geologists of Ireland (IGI) and European Commission environmental impact assessment guidance:

Environmental Protection Agency (2015). *Advice Notes for Preparing Environmental Impact Statements Draft*.

Environmental Protection Agency (2022). *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*.

Environmental Protection Agency and GSI, (2009). *Historic Mine Sites – Inventory and Risk Classification*.

European Commission, (2017). *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*.

GSI Spatial Viewer (https://dcenr.maps.arcgis.com) for information on soils, geology and hydrogeology

IGI (2013). *Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*.

Irish Geological Heritage Programme of the GSI (https://www.gsi.ie/en-ie/programmes-and-projects/geoheritage/Pages/default.aspx)

National Roads Authority (now TII), (2009). *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Schemes*.

Online Sources

Cork City Council (CCC) (Extent of the public water supply schemes within the study area, Extractive Industries Register) (https://www.epa.ie/our-services/compliance--enforcement/waste/extractive-industries-register/)

Environmental Protection Agency (EPA) (https://gis.epa.ie)

National Parks & Wildlife Service (http://www.npws.ie/)

Ordnance Survey of Ireland online historic mapping and aerial photographs GeoHive (https://www.map.geohive.ie)

Teagasc and the Environmental Protection Agency Irish Soil Information System (http://gis.teagasc.ie/soils/index.php)

The Office of Public Works (OPW) (www.opw.ie)

## Note: Chapter 13 Figures on following pages.

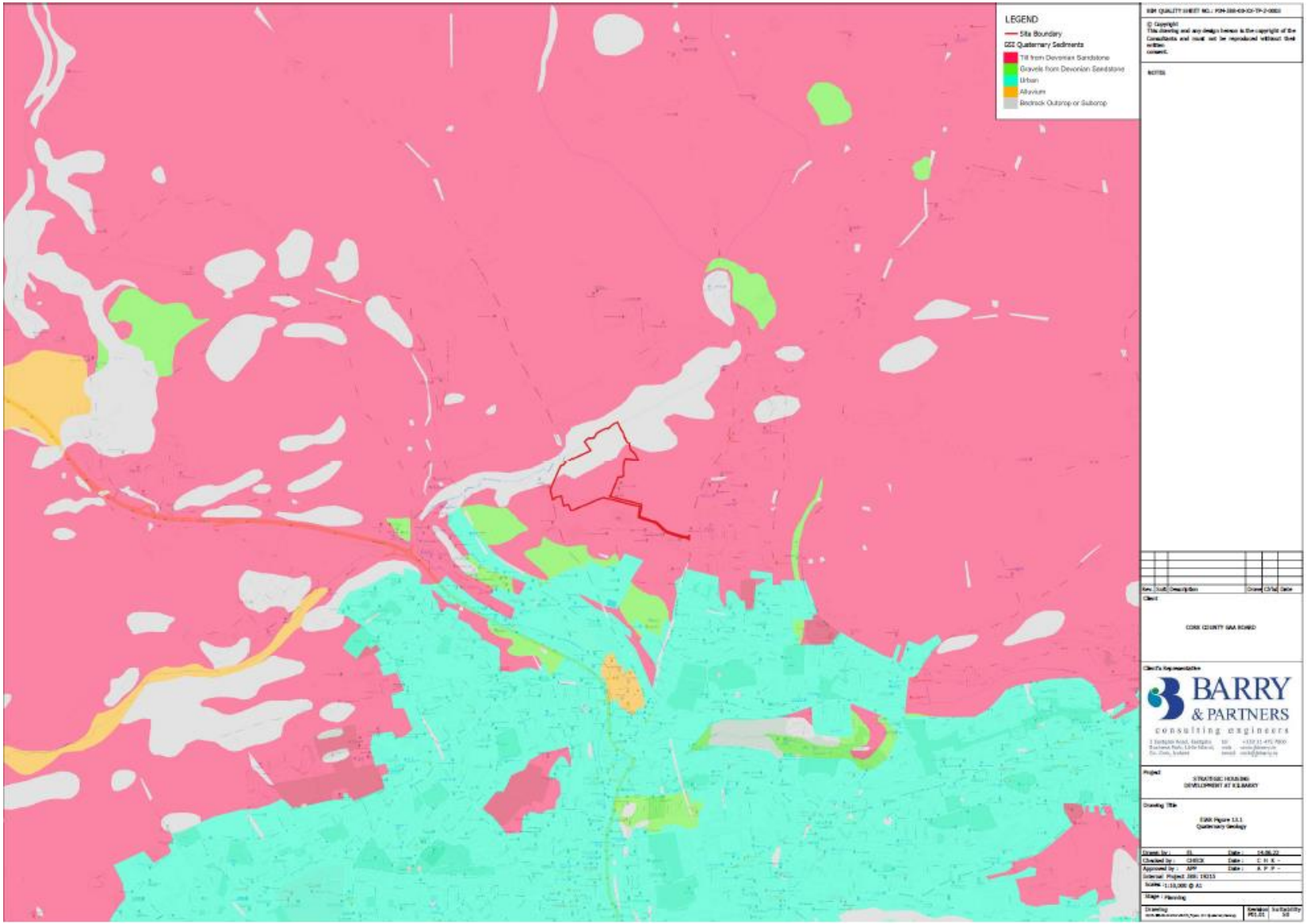


**Figure 13.1 Quaternary Geology**

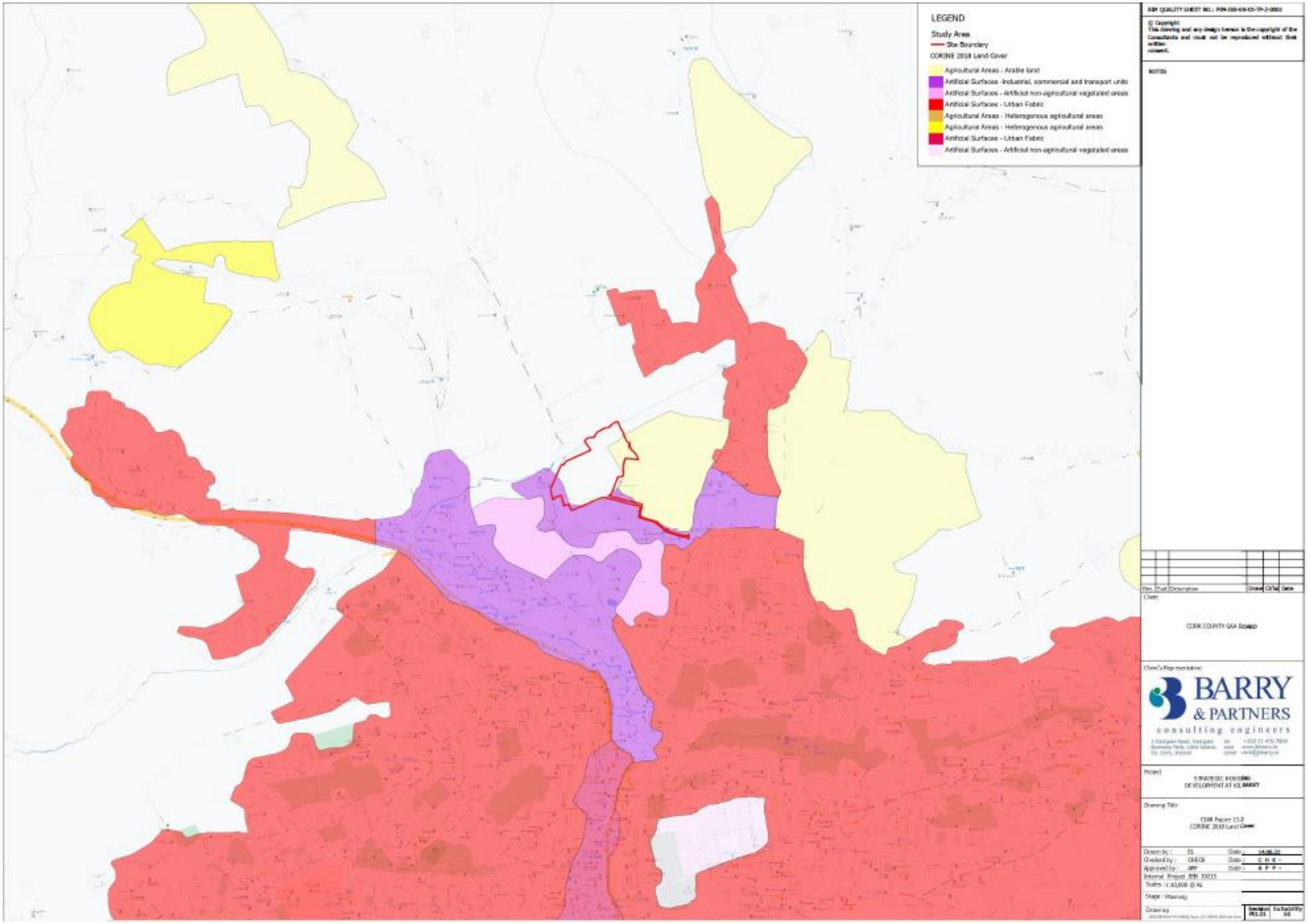


**Figure 13.2 Corine 2018 Land Cover**

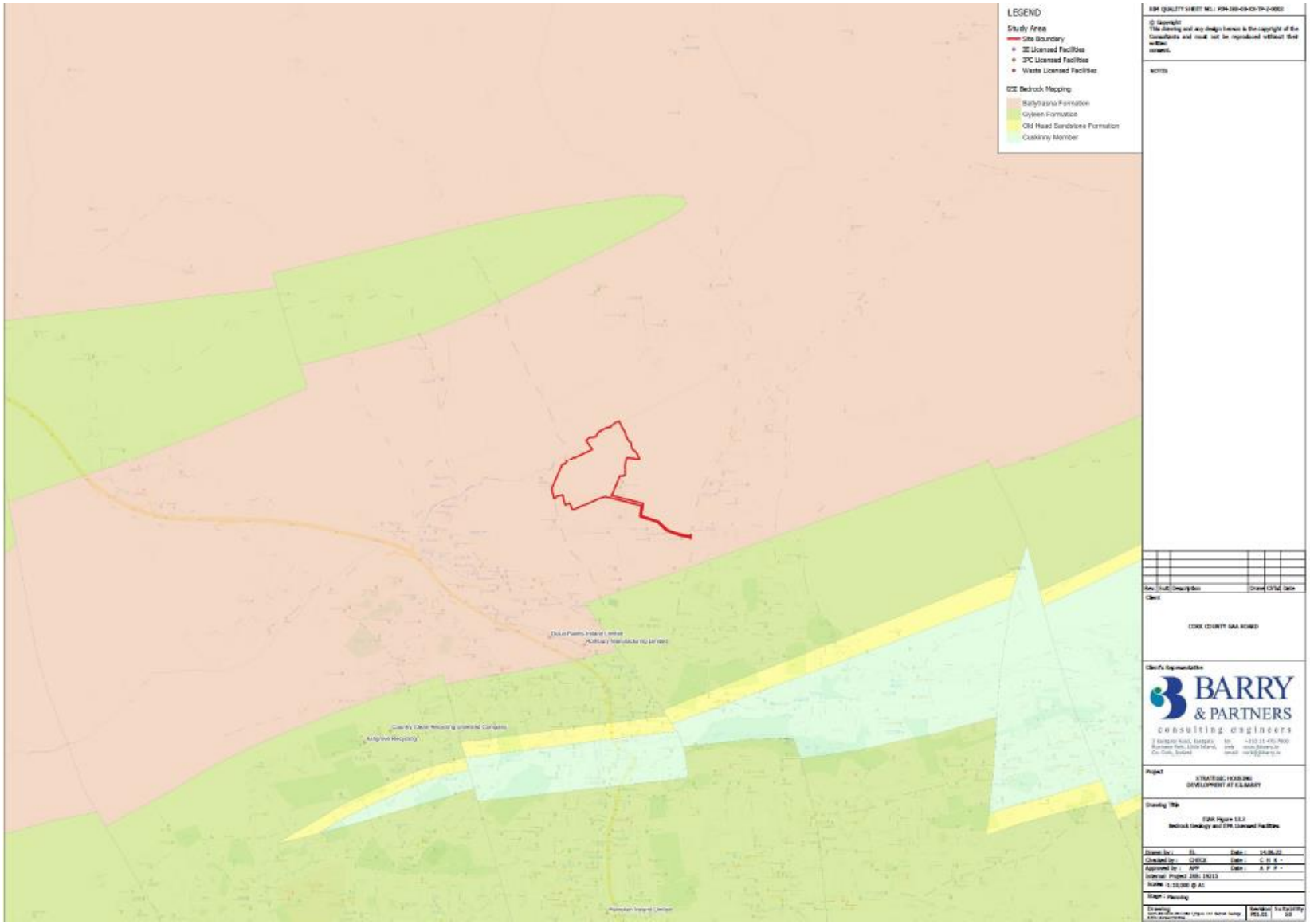


**Figure 13.3 Bedrock Geology and Licenced Facilities**

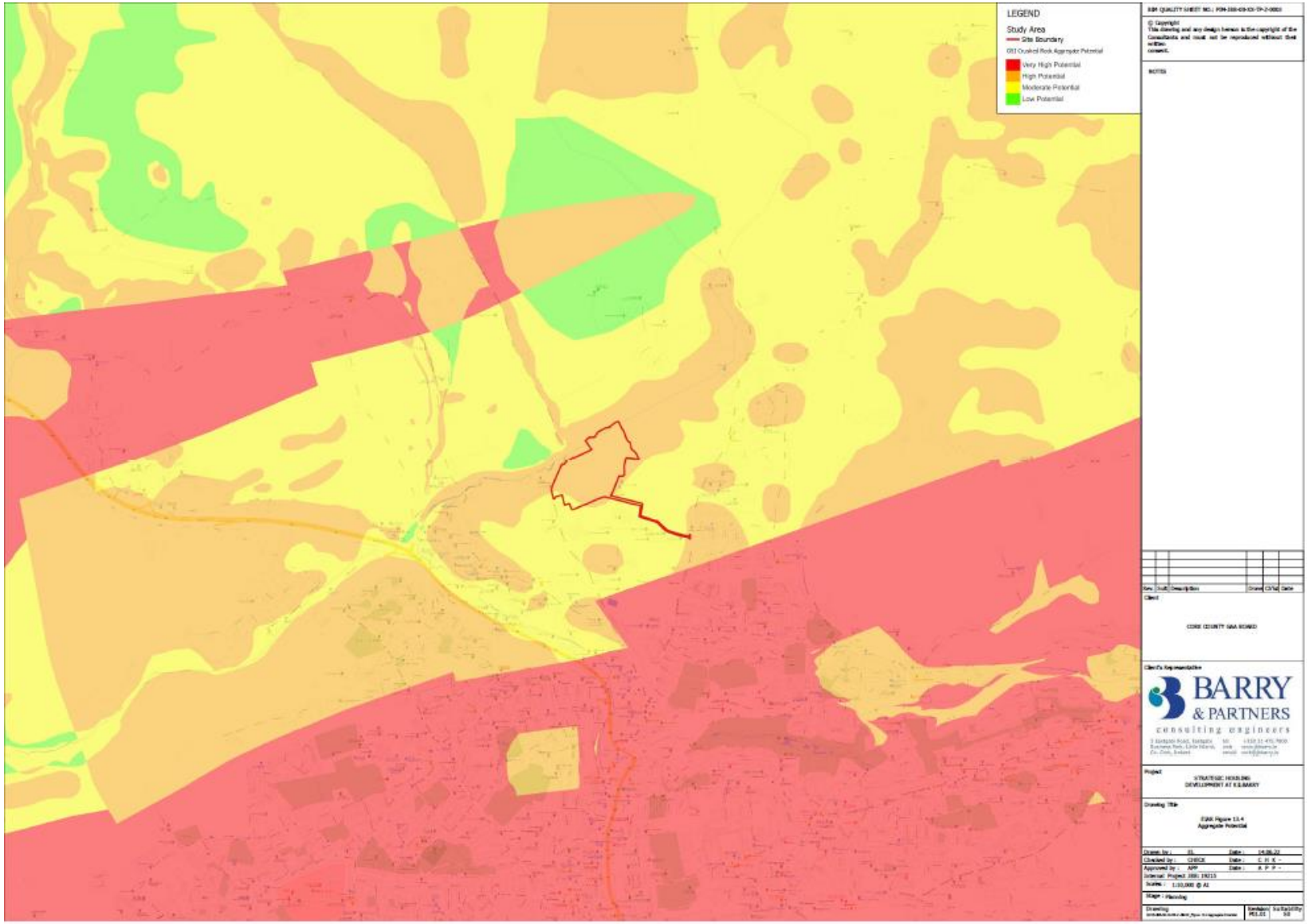


**Figure 13.4 Aggregate Potential**

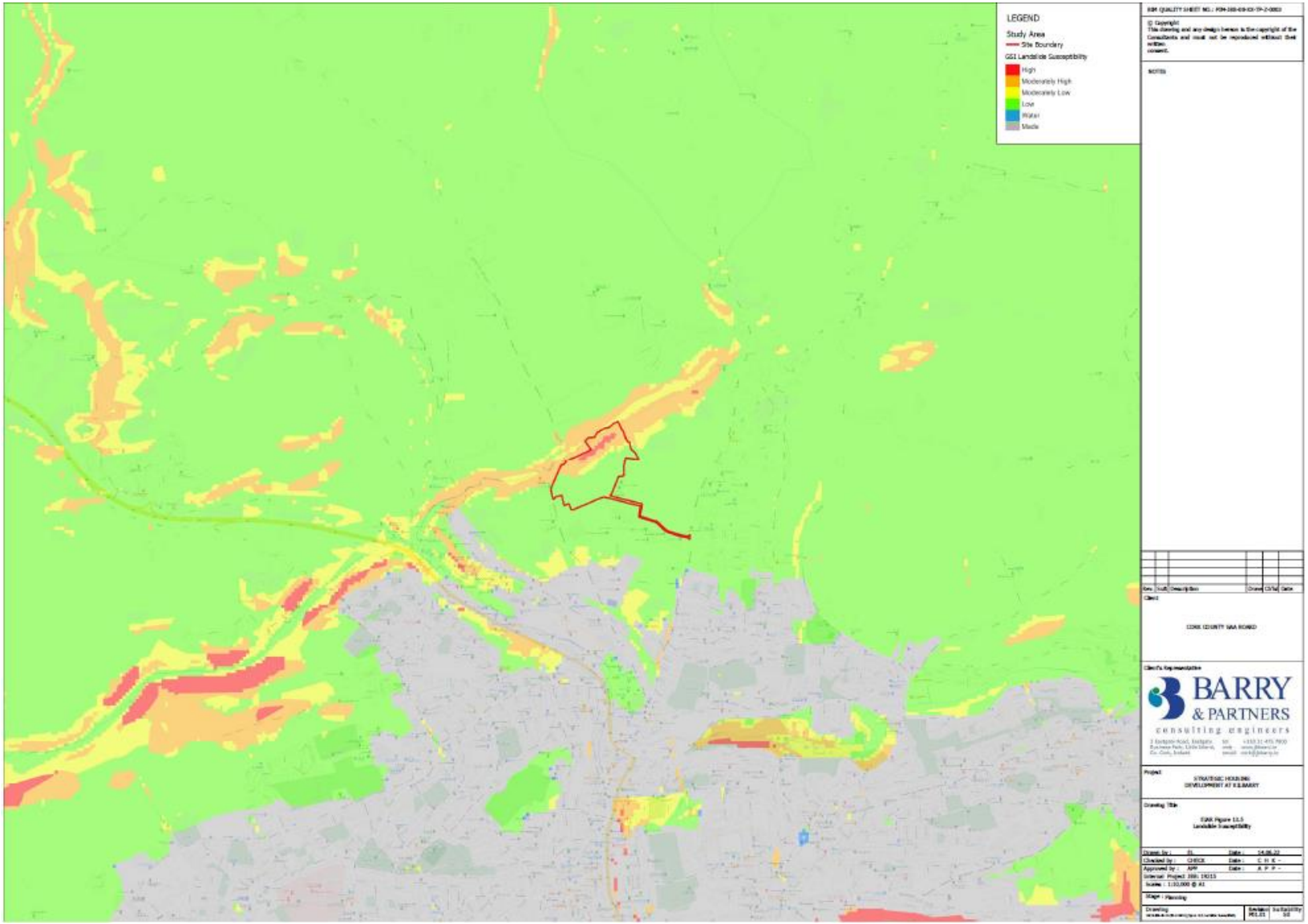


**Figure 13.5 Landslide Susceptibility**

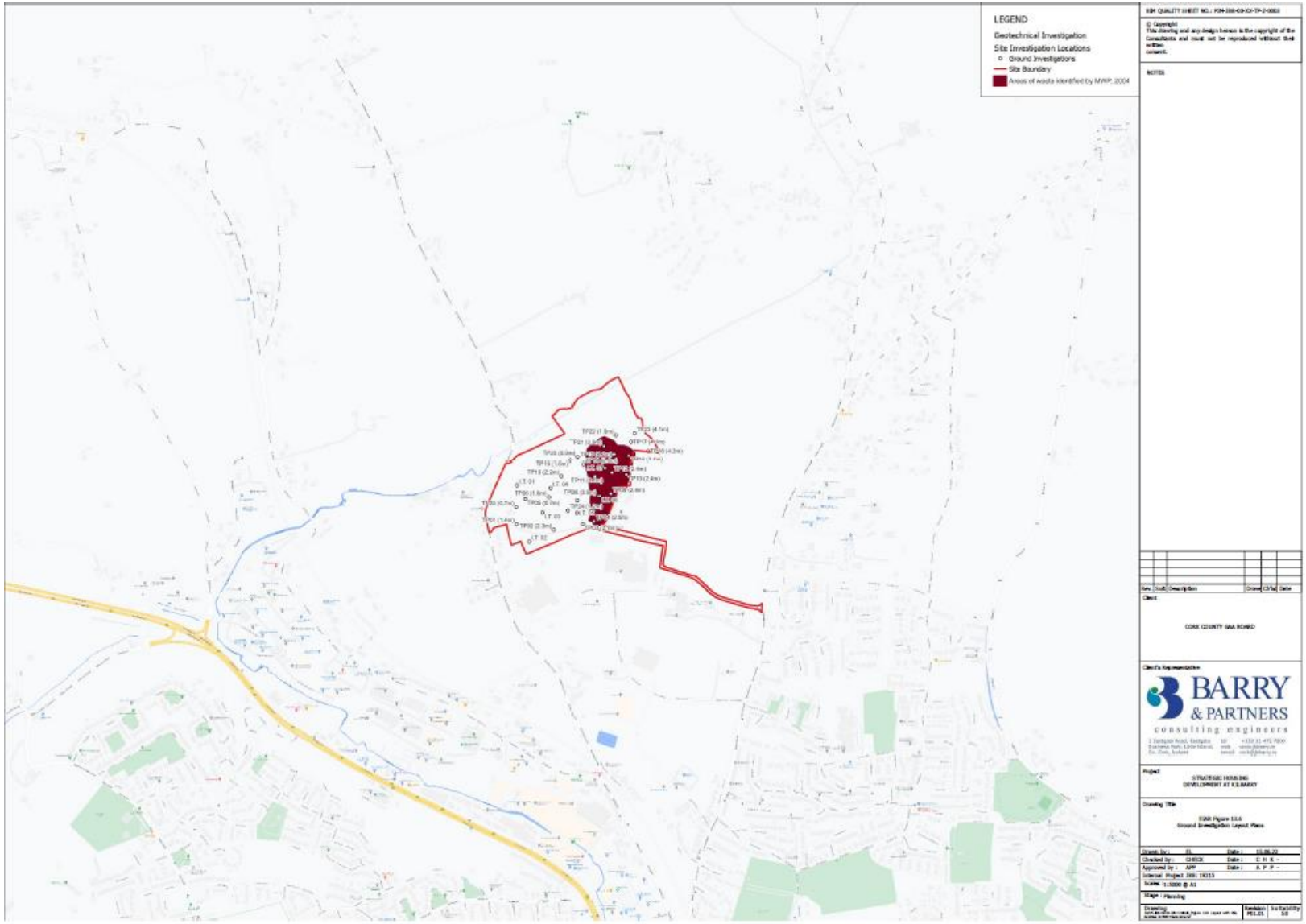


**Figure 13.6 Layout of PGL Localities & MWP Made Ground**

## 14.0 WATER

**Content**



**Figures and Tables**

## 14.1 Introduction

### 14.1.1 Chapter Author

This Chapter has been prepared by John Fallon and Kieran O'Dwyer, both of J. B. Barry and Partners, Consulting Engineers.

John Fallon is a Senior Environmental Engineer with J.B Barry & Partners Consulting Engineers who has over 17 years' experience in the geotechnical / environmental sector. John has an honours Degree in Geology from University College Cork (1998), and a MSc in Civil / Environmental Engineering from Trinity College Dublin (2005) and is a Chartered Environmentalist (CEnv) with the Institute of Environmental Science. John's experience includes the coordination and preparation of environmental impact assessment reports for residential, water and road infrastructure schemes.

Kieran O'Dwyer who is an Associate Director with J. B. Barry and Partners and has over 40 years' experience in the field of environmental and hydrogeological consultancy. He was formerly a director with K. T. Cullen and Co. Ltd (Environmental Consultants) and a Regional Director with WYG Ireland. Kieran has been responsible for the Land Soils and Hydrogeology element of numerous Environmental Impact Assessments (including TII tranche 4 motorway service areas (3 No.), NRA Tranche 4 Motorway Service Areas (5 No. oral hearings) and Ringsend Wastewater Treatment Plant Upgrade Project) and has presented specialist evidence at numerous oral hearings.

### 14.1.2 Chapter Context

This section of the EIAR describes the existing water bodies in the vicinity of a proposed Strategic Housing Development (SHD) on a circa 15.52 hectare site located at Kilbarry, Cork. A detailed description of the proposed development is outlined and presented in Chapter 4: Project Description.

This chapter provides an assessment of the likely significant effects on the nearby water bodies (surface water and groundwater) during the construction and operational phases of the proposed development. In this chapter the potential impacts during the Construction and Operational phase are discussed and assessed. Appropriate mitigation measures to limit any significant impacts to water – hydrology and hydrogeology are recommended, and any residual impacts are also identified.

### 14.1.3 Methodology

**Guidance**

The Water (Hydrology and Hydrogeology) section of the EIAR is prepared in accordance with the following guidelines:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022)
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2017)

- Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Environmental Impact Assessment of Projects Guidance on Scoping 2017
- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements by the Institute of Geologists of Ireland (IGI, 2013)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018
- Water Framework Directive 2000/60/EC
- S.I. No. 41 of 1999: Protection of Groundwater Regulations, resulting from EU Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances (the Groundwater Directive)
- S.I. No. 249 of 1989: Quality of Surface Water Intended for Abstraction (Drinking Water), resulting from EU Directive 75/440/EEC concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (repealed by 2000/60/EC in 2007)
- S.I. No. 439 of 2000: Quality of Water intended for Human Consumption Regulations and S.I. No. 278 of 2007 European Communities (Drinking Water No. 2) Regulations, arising from EU Directive 98/83/EC on the quality of water intended for human consumption (the Drinking Water Directive) and WFD 2000/60/EC (the Water Framework Directive)
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009
- S.I. No. 9 of 2010: European Communities Environmental Objectives (Groundwater) Regulations 2010

The impacts on the following were assessed:

- Regional water regime: Flow and water quality
- Local water regime: Flow and water quality
- Flooding
- Bedrock aquifer (resource)
- Groundwater vulnerability (water quality) and
- Groundwater supply.

**Site Investigation**

The following surveys / investigations were undertaken to inform this Chapter:

Site Investigation - Ground investigations were carried out to establish subsurface conditions at the proposed project site by Priority Geotechnical Ltd between 7th August and 13th September 2019 and between 29th January and 1st February 2021.

A flood risk assessment for the proposed development was completed by J B Barry & Partners (see separate Flood Risk Assessment).

**Assessment methodology**

The Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022) state that where more specific definitions exist within a specialised factor or topic that these should be used in preference to the generalised definitions. Using this rationale, the methodology follows the information from

the Appendix C2 NRA Guidance and Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013). NRA Guidance (2009) was also used for the estimation of importance of hydrology attributes.

An estimation of the Importance of the feature for hydrogeology within the study area is assessed using the criteria set out in Table 14.7.

| Importance | Criteria | Typical example |
|---|---|---|
| **Extremely High** | Attribute has a high quality or value on an international scale. | Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g., SAC or SPA status. |
| **Very High** | Attribute has a high quality or value on a regional or national scale. | Regionally Important Aquifer with multiple wellfields.<br>Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g., NHA status.<br>Regionally important potable water source supplying >2500 homes.<br>Inner source protection area for regionally important water source. |
| **High** | Attribute has a high quality or value on a local scale. | Regionally Important Aquifer.<br>Groundwater provides large proportion of baseflow to local rivers.<br>Locally important potable water source supplying >1000 homes.<br>Outer source protection area for regionally important water source.<br>Inner source protection area for locally important water source. |
| **Medium** | Attribute has a medium quality or value on a local scale. | Locally Important Aquifer.<br>Potable water source supplying >50 homes.<br>Outer source protection area for locally important water source. |
| **Low** | Attribute has a low quality or value on a local scale. | Poor Bedrock Aquifer.<br>Potable water source supplying <50 homes. |

**Table 14.7: Criteria for Rating Site Importance of Hydrogeological Features (NRA, 2008).**

Estimation of the Magnitude of the impact on the feature (Hydrogeology attribute) from the proposed development is given in Table 14.8.

| Magnitude of Impact | Criteria | Typical Examples |
|---|---|---|
| **Large Adverse** | Results in loss of attribute and/or quality and integrity of attribute. | Removal of large proportion of aquifer.<br>Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems.<br>Potential high risk of pollution to groundwater from routine run-off.<br>Calculated risk of serious pollution incident >2% annually. |
| **Moderate Adverse** | Results in impact on integrity of attribute or loss of part of attribute. | Removal of moderate proportion of aquifer.<br>Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems.<br>Potential medium risk of pollution to groundwater from routine run-off.<br>Calculated risk of serious pollution incident >1% annually. |
| **Small Adverse** | Results in minor impact on integrity of attribute or loss of small part of attribute. | Removal of small proportion of aquifer.<br>Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems.<br>Potential low risk of pollution to groundwater from routine run-off.<br>Calculated risk of serious pollution incident >0.5% annually. |
| **Negligible** | Results in an impact on attribute but of insufficient magnitude to affect either use or integrity. | Calculated risk of serious pollution incident <0.5% annually. |

**Table 14.8: Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute (NRA, 2008).**

Determining the Significance of the impact on the feature (hydrogeology attribute) based on the Importance of the feature and the Magnitude of the impact is given in Table 14.9.

| Importance of Attribute | Magnitude of Impact | | | |
|---|---|---|---|---|
| | **Negligible** | **Small Adverse** | **Moderate Adverse** | **Large Adverse** |
| **Extremely High** | Imperceptible | Significant | Profound | Profound |
| **Very High** | Imperceptible | Significant/ Moderate | Profound/ Significant | Profound |
| **High** | Imperceptible | Moderate/ Slight | Significant/ Moderate | Profound/ Significant |
| **Medium** | Imperceptible | Slight | Moderate | Significant |
| **Low** | Imperceptible | Imperceptible | Slight | Slight/ Moderate |

**Table 14.9: Rating of Significant Environmental Impacts at EIS Stage (NRA, 2008).**

**Source of Information**

The information on hydrology and hydrogeology underlying the proposed development site was obtained through assessing databases and archives available. The following are the sources of datasets for this chapter:

- Environmental Protection Agency (EPA) – database information and website mapping
- EPA/Water Framework Directive Map Viewer (www.catchments.ie)
- National Flood Hazard Mapping (www.floodinfo.ie) – past flood event data
- Geological Survey of Ireland (GSI) On-line Geological datasets (www.gsi.ie)

## 14.2 Description of Baseline/ Existing Environment

### 14.2.1 Local Hydrology & Water Quality

The main hydrological feature of the area is the River Bride. The River Bride is a tributary to the River Lee and flows in a south westerly direction forming the northern boundary of the site. Figure 14.1 below illustrates the main hydrological features associated with the site.

The site is bound to the north by the Glennamought River, a tributary to the River Bride, which is itself a tributary to the River Lee. The Lee Estuary is a designated Water Framework Directive (WFD) transitional water body (IE_SW_060_0950), with an ecological status of Moderate, and deemed to be At Risk.

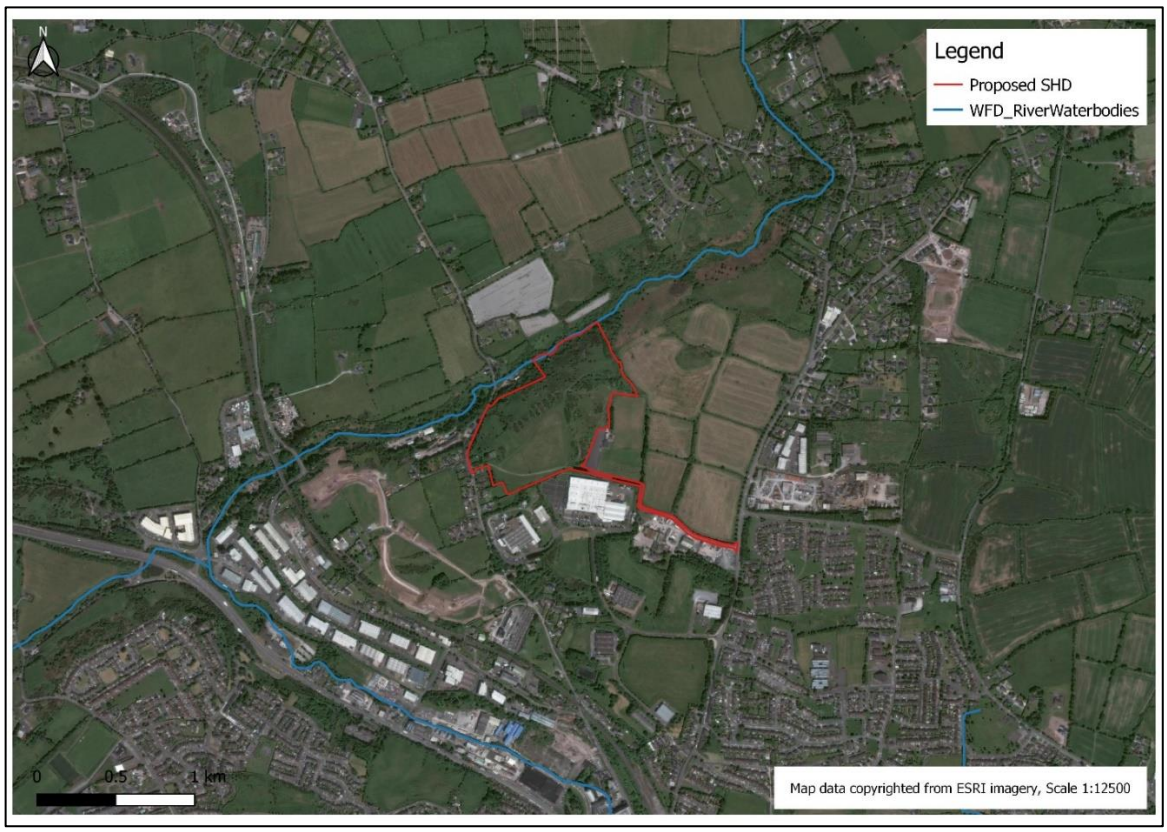


**Figure 14.4: Hydrological Features**.

### 14.2.2 Regional Hydrology & Water Quality

On a regional scale, the study area is located within the Hydrometric Area No.19 which is the EPA classification for the catchments. The proposed site and adjacent watercourse (Glennamought Trib Bride_10) is within the Kiln_SC_010 sub-catchment, which is within the River Lee, Cork Harbour and Youghal Bay catchment under the Water Framework Directive (WFD). This Hydrometric Area falls within the South Western River Basin District which is the WFD designated catchment for the local area.

The European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy, commonly known as the Water Framework Directive (WFD). The WFD is an important piece of environmental legislation which aims to improve water quality. The WFD classification scheme for water quality includes five status classes: high, good, moderate, poor, and bad.

'High status' is defined as the biological, chemical, and morphological conditions associated with no, or very low, human pressure. This is also called the 'reference condition' as it is the best status achievable - the benchmark. Assessment of quality is based on the extent of deviation from these reference conditions. 'Good status' means a 'slight' deviation from this condition, 'moderate status' means 'moderate' deviation, and so on.

The Glennamought Trib Bride_10 which is a river body in the vicinity of the site has an 'Unassigned' WFD status (2013-2018) and WFD risk is under 'review' (unknown).

The water quality within the designated water courses may be affected by the quantity and quality of surface water run-off from the adjacent lands. Poor construction and water management practices during the

construction and operational phases of the development have the potential to impact on local surface water quality. Mitigation measures (refer to Section 14.6) will ensure that surface runoff from the developed areas of the site will be of a high quality and will therefore not impact on the status of downstream surface water bodies. The site is underlain by the Ballinhassig East groundwater body (IE_SW_G_004). EPA sampling from the 2013 – 2018 WFD assessment indicates that it had a 'good' status. The risk of not meeting the WFD objectives is presently under review.

| **Overall Groundwater Status** | Good |
|---|---|
| **Quantitative Groundwater Status** | Good |
| Saline (or Other) Intrusions Test | Good |
| Impact of Groundwater on Surface Water Ecological/Quantitative Status Test | Good |
| Groundwater Dependent Ecosystems (GWDTE) - Quantitative Assessment Test | Good |
| Water Balance Test | Good |
| **Chemical Groundwater Status** | Good |
| Saline (or Other) Intrusions Test | Good |
| Impact of Groundwater on Surface Water Ecological/Chemical Status Test | Good |
| Groundwater Dependent Ecosystems (GWDTE) - Chemical Assessment Test | Good |
| Drinking Water Protected Area Test | Good |
| General Chemical Assessment Test | Good |

**Table 14.10: Ballinhassig East GWB WFD Status.**

Mitigation measures (refer to 14.6.1) will ensure that surface runoff from the developed areas of the site will be of a high quality and will therefore not impact on the status of underlying groundwater bodies.

### 14.2.3 Flood Risk

The National Flood Hazard Mapping website operated by the OPW (www.floodinfo.ie) has collated records of historic flooding events throughout Ireland. According to the National Flood Hazard Mapping there was no record of historic flooding occurring at the site of the proposed development. However, it does show instances of flooding nearby to the site, most notably at the residential property to the north west of the site along the Old Mallow Road in June 2012. Flooding also occurred at a commercial property approximately 350m to the west of the site on the same date. This flooding was caused by the River Bride overflowing its banks. The recorded floods within the vicinity of the site are shown in *Figure 3.4* of the Flood Risk Assessment report.

There have been instances of recurring flooding further downstream of the River Bride in Blackpool village. Floodmaps.ie has records of flooding in Blackpool as recently as 2012. The source of the flooding at Blackpool is from the River Bride. Due to the existing risk of flooding downstream at Blackpool, it is essential that surface runoff to the River Bride is not increased as a result of the proposed development.

The CFRAMs map and Cork City Council flood maps both indicate that the northern portion of the proposed development site is at risk to flooding from the River Bride. However, no development will take place at this

portion of the site. All development including highly vulnerable development will occur outside of any fluvial flood extent. Therefore, the proposed development site lies within the Fluvial Flood Zone C – low flood risk.

Therefore, the proposed development is deemed 'Appropriate' in accordance with the Office of Public Work (OPW) Flood Risk Management Guidelines.

The downstream / lower reaches of Glennamought Trib (Bride)_010, the eastern section of Bride (Cork City)_010 near Killeens road and the Bride (Cork City)_020 are proposed for flood relief works under the River Bride (Blackpool) Certified Drainage Scheme. Works associated with the Scheme will include construction of new culverts, replacement of existing bridges and culverts, construction of new flood walls/earthen embankments, local channel widening and maintenance of the river channel.

### 14.2.4 Bedrock Aquifer

The Geological Survey of Ireland has classified the aquifer based on the groundwater resources and hydrological characteristics (such as the area extent, well yield, specific capacity and groundwater throughput). There are three main types of aquifers namely: Regionally Important Aquifer, Locally Important Aquifer and Poor Aquifer. Each of these three main categories is further subclassified (refer Table 14.11)

| Aquifer Type | Description | Code |
|---|---|---|
| **Regionally Important (R)** | Karstified (diffuse) | (Rkd) |
| | Karstified (conduit) | (Rkc) |
| | Fissured | (Rf) |
| | Extensive sand & gravel | (Rg) |
| **Locally Important (L)** | Sand and gravel | (Lg) |
| | Bedrock which is Generally Moderately Productive | (Lm) |
| | Bedrock which is Moderately Productive only in Local Zones | (Ll) |
| | Locally important karstified bedrock | (Lk) |
| **Poor (P)** | Bedrock which is Generally Unproductive except for Local Zones | (PL) |
| | Bedrock which is Generally Unproductive | (Pu) |

**Table 14.11: Main categories of Bedrock Aquifer.**

According to the GSI Mapping, the proposed development site is underlain entirely by 'Locally Important Aquifer' - Bedrock which is Moderately Productive only in Local Zones (Ll).

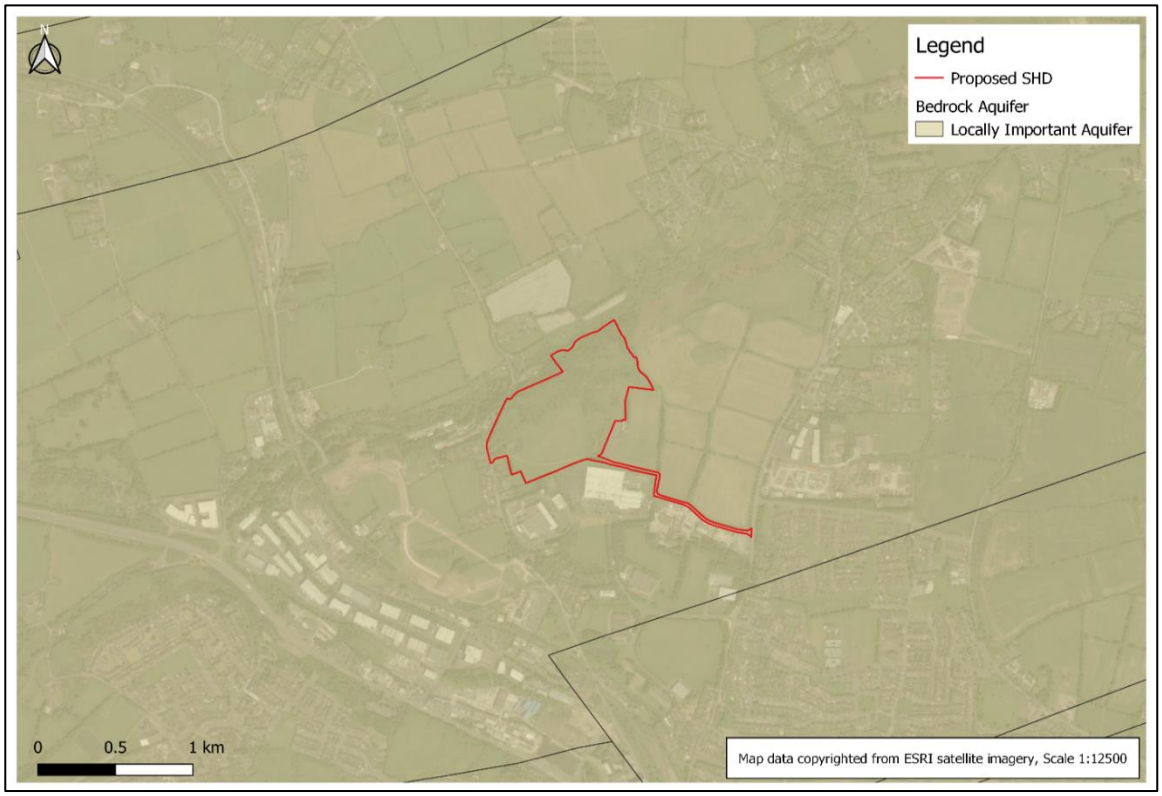


**Figure 14.5: Bedrock Aquifer.**

### 14.2.5 Groundwater Vulnerability

According to GSI, the Groundwater Vulnerability represents the intrinsic geological and hydrogeological characteristics that determine the ease at which groundwater may be contaminated by human activities. The vulnerability of the groundwater depends on the time travel of infiltrating water, the quantity of contaminants that reach the groundwater and the contaminant attenuation capacity of the geological materials through which the water and contaminants infiltrate. The final vulnerability rating of an area is determined by the permeability and thickness of the subsoils underlying the groundwater, and the type of recharge sources (diffuse or point source). Therefore, areas where the infiltrating water and contaminants move faster from land to groundwater with high permeability are more vulnerable.

Based on the geological and hydrogeological characteristics, groundwater vulnerability is divided into four main categories: Extreme (E), High (H), Moderate (M) and Low (L) as shown in Table 14.12.

| Vulnerability Rating 2312 | Hydrological Conditions | | | | |
|---|---|---|---|---|---|
| | Subsoil Permeability (Type) and Thickness | | | Unsaturated Zone | Karst Features |
| | High Permeability (sand/gravel) | Medium Permeability (Sandy subsoil) | Low Permeability (Clayey subsoil, clay, peat) | (Sand/gravel aquifers only) | (<30m radius) |
| Extreme (E) | 0 – 3.0m | 0 - 3.0m | 0 – 3.0m | 0 – 3.0m | n/a |
| 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 |

| Vulnerability Rating 2312 | Hydrological Conditions | | | | |
|---|---|---|---|---|---|
| | Subsoil Permeability (Type) and Thickness | | | Unsaturated Zone | Karst Features |
| | High Permeability (sand/gravel) | Medium Permeability (Sandy subsoil) | Low Permeability (Clayey subsoil, clay, peat) | (Sand/gravel aquifers only) | (<30m radius) |
| Low (L) | n/a | n/a | >10.0m | n/a | n/a |
| n/a = not applicable<br>Precise permeability values cannot be given at present<br>Release point of contaminants is assumed to be 1-2m below ground surface | | | | | |

**Table 14.12 Main categories of groundwater vulnerability.**

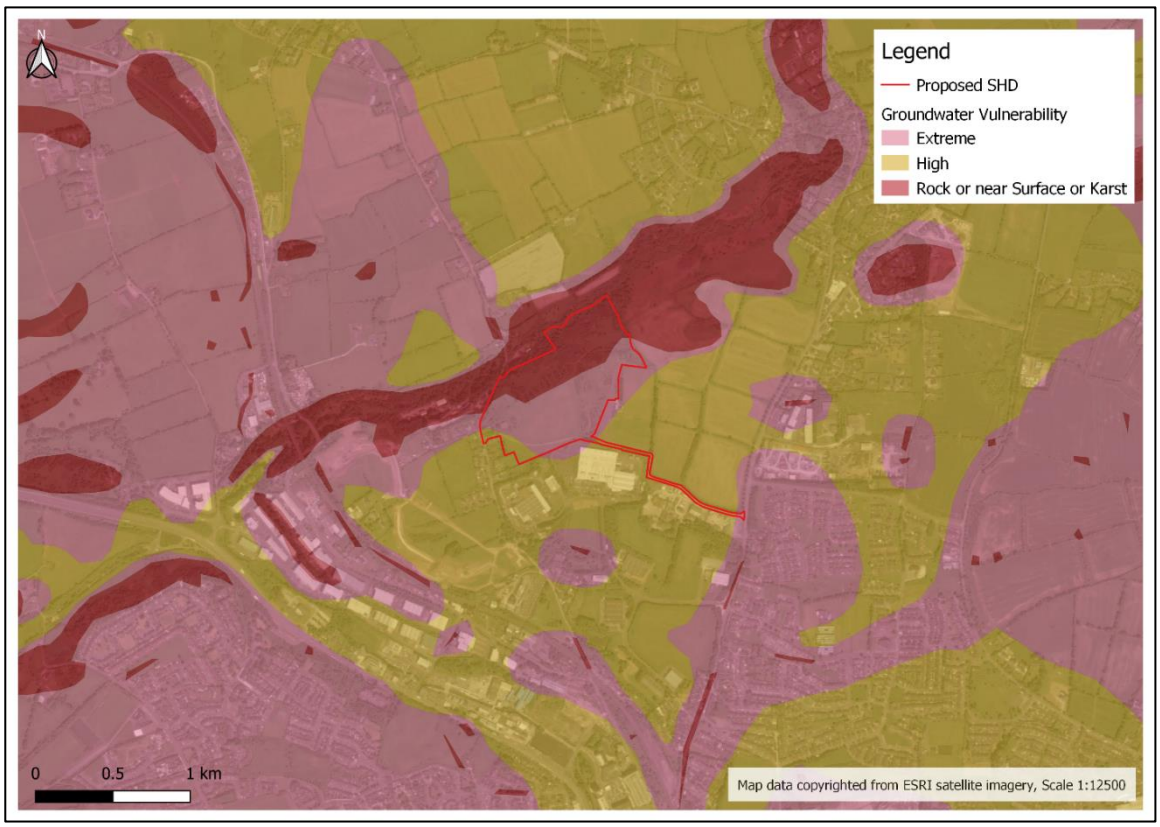


**Figure 14.6: Groundwater Vulnerability.**

According to the GSI the vulnerability classification for the proposed development site is 'Extreme' vulnerability rating with some 'rock or near surface rock' identified at the north end of the site. Small areas of the south end of the site with 'High' vulnerability. The Ground Investigation data as detailed in Chapter 13: Land, Soils & Geology is consistent with the GSI Vulnerability Classification.

### 14.2.6 Groundwater Supply

The Water Framework Directive (WFD) provides for the protection, improvement, and sustainable use of waters, including rivers, lakes, coastal waters, estuaries, and groundwater within the EU Member States. It aims to prevent deterioration of these water bodies and enhance the status of aquatic ecosystems; promote sustainable water use; reduce pollution; and contribute to the mitigation of floods and droughts. A search of private well

locations (wells with location accuracy of 1km, 100m and 50m were sought) was undertaken using the GSI well database (www.gsi.ie).

There is a well 10-50B (50m mapped accuracy) located 550m to the southwest and a well 100-50B (100m mapped accuracy) located 670m to the northwest of the construction site.

No wells were mapped in the area of the proposed development site. Based on the GSI well database, there are no mapped source zones (Group Scheme and Public Supply Source Protection Areas) mapped within ~3km of the development site.

GSI mapping of 'Groundwater Wells and Springs' indicates that there are 18 no. wells recoded within the 2 km study area as shown on and detailed below in Table 14.7 and Figure 14.7.

| GSI Name | Townland | Well type | Depth | Use | Yield ($m^3d$) |
|---|---|---|---|---|---|
| 1407SEW106 | Kilbarry | Borehole | 34.6 | Agri & domestic use | N/A |
| 1407SEW107 | Kilbarry | Borehole | 30 | Agri & domestic use | N/A |
| 1407SEW108 | Kilbarry | Borehole | 45 | Unknown | N/A |
| 1407SEW109 | Kilnap | Borehole | 60 | Unknown | N/A |
| 1407SEW068 | Ballincolly | Borehole | 38.1 | Domestic use only | Moderate |
| 1407SEW069 | Ballincolly | Borehole | 38.1 | Domestic use only | Moderate |
| 1407SEW071 | Lahardane | Borehole | 30.5 | Domestic use only | Poor |
| 1407SEW163 | Garraneboy | Borehole | 73.1 | Agri & domestic use | Moderate |
| 1407SEW072 | Ballincrokig | Borehole | 38.1 | Domestic use only | Moderate |
| 1407SEW082 | Ballincrokig | Borehole | N/A | Public supply | N/A |
| 1407SEW118 | Kilnap | Borehole | 91 | Industrial use | Moderate |
| 1407SEW073 | Kilbarry | Borehole | 99.1 | Unknown | Good |
| 1407SEW119 | Ballyvolane | Borehole | 24.4 | Unknown | Poor |
| 1407SEW042 | Kilcully | Borehole | 25.6 | Unknown | Poor |
| 1407SEW041 | Kilcully | Borehole | 21 | Unknown | Poor |
| 1407SEW043 | Kilcully | Borehole | 38.1 | Unknown | Poor |
| 1407SEW027 | Ballincrokig | Borehole | 31.7 | Unknown | Poor |
| 1407SEW046 | Lahardane | Borehole | 18.3 | Unknown | Poor |

**Table 14.7: Groundwater wells.**

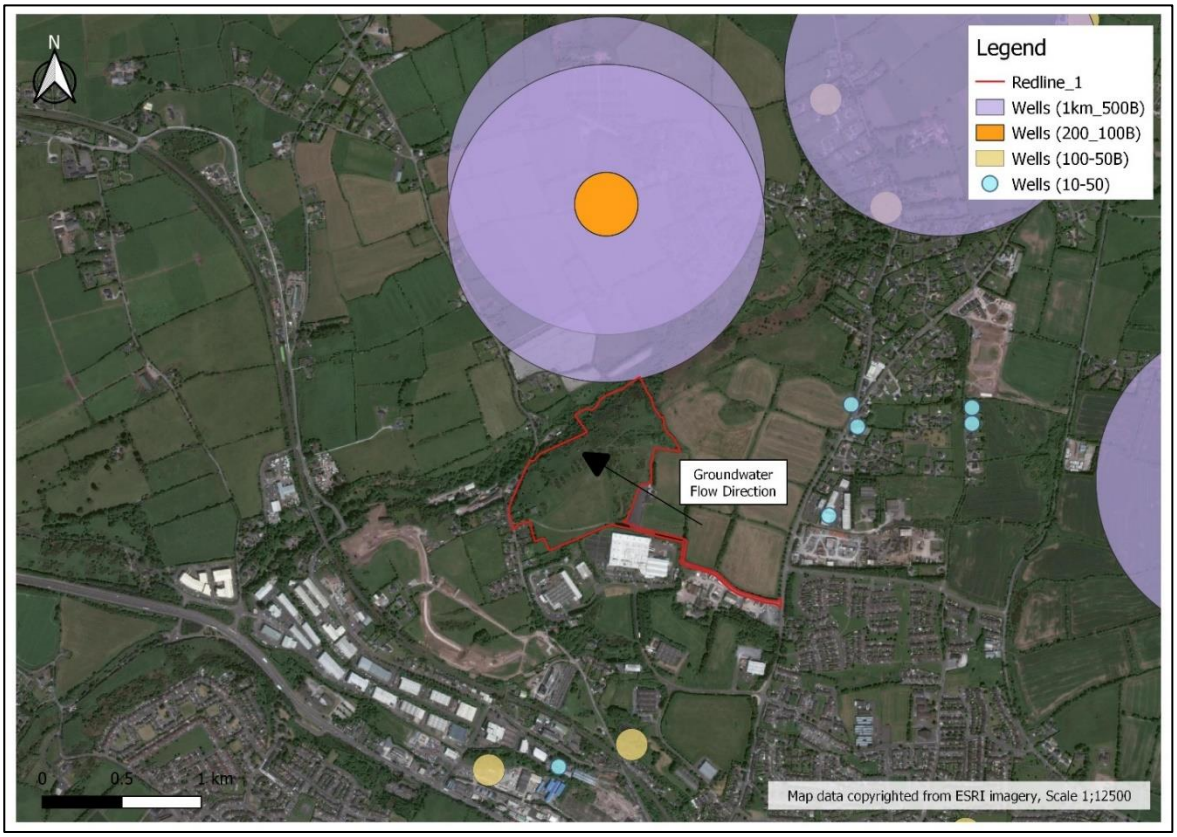


**Figure 14.7: Groundwater Supply.**

## 14.3 Characteristics of the Proposed Development

Consideration of the characteristics of the proposed development allows for a projection of the 'level of impact' on any particular aspect of the proposed environment that could arise. For this chapter the potential impact on Water is assessed and therefore characteristics of the proposed development that may impact on water bodies.

### 14.3.1 Surface water drainage

The proposed surface water drainage will include a drainage pipe network, attenuation storage and SuDS features. The restricted discharge from the site will discharge to the adjacent watercourse (Glennamought Trib Bride_10) to the north of the site.

It is is proposed to directionally drill for a section of the proposed stormwater outfall pipe (under the Marsh Fritillary butterfly habitat area as mitigation by design) at depths of between 3.4m and 4.2m below existing ground level. The stormwater outfall pipe will then discharge to a constructed stream bed in a meandering depression; approx. 500mm deep with a variable width, cut into the existing terrain. The stream is stepped using rocks with raised check dams in coursed random rubble with lining & overflows at 5m contour intervals. The stream bed is lined with weed control matting, rounded river rock & gravel to prevent clogging with vegetation, to promote percolation and prevent soil erosion. The Headwall at the junction with the Glenamought River will be constructed as per the stonewalled check dams along the stream course (Glennamought Trib Bride_10). The extent of the stormwater proposals are detailed in Drainage drawing ref: 19215-JBB-00-XX-DR-C-04000_Proposed Drainage Layout – Overall and the Overall Landscape Plan.

### 14.3.2 Potable water supply

A 150mm diameter ductile iron watermain is located in the existing Old Whitechurch Road that forms the western boundary of the development.

A Pre-Connection Enquiry was submitted to Irish Water, the response to which confirmed that the proposed development can be serviced by the existing water infrastructure network in the area. A copy of the confirmation is included in Appendix 16.5 of this EIAR.

The Confirmation of feasibility states that sufficient capacity is available in the IW network to facilitate a water connection of 330 units. IW have advised that the connection is to be made via a 250mm diameter watermain to the 300mm watermain in the Kilbarry Business Park to the south. This can be done by upgrading approximately 750m of watermain on the Old Whitechurch Road to 250m or finding another route with a wayleave through the adjoining business park. An initial phase of approximately 100 houses can be connected without upgrade requirements.

Further discussions with Irish Water have confirmed that the upgrade of the existing watermain will be carried out by Irish Water on foot of a Connection Application for the development in due course and will be timed to serve the construction of the various phases of the development.

Fire hydrants will be provided such that each building will be within 45m of a hydrant and these hydrants will be provided so as to be fully accessible to the fire service.

Sluice valves will be installed on all principal watermain connections to ensure that sections of the development can be isolated for maintenance and repair as required.

A water-meter will be installed on the main connections, subject to detailed agreement with Irish Water/Cork City Council.

### 14.3.3 Surface Water Networks (Streams)

Surface water runoff from the site in its current, largely greenfield condition, infiltrates to ground through existing vegetation and ultimately to existing ground and the Glenamought River. There are currently no existing significant drainage channels or point discharges to the Glennamought River within the site.

A new open channel to the Glenamought River for storm water runoff will be constructed as part of the proposed development. Stormwater runoff from the proposed development will be managed and controlled to match the runoff from the site in its current greenfield condition through the provision of best-practise SuDS measures (as detailed in Drainage Drawing Ref: 19215-JBB-00-XX-DR-C-04000_Proposed Drainage Layout – Overall).

### 14.3.4 Foul Water Drainage

Wastewater collection within the proposed development will be via a network of 150mm and 225mm diameter gravity sewers, which will direct the flows to the western boundary of the site and will connect directly to the foul sewer in the Whitechurch Road.

A Pre-Connection Enquiry was submitted to Irish Water, the response to which confirmed that the proposed development can be serviced by the existing wastewater infrastructure network in the area.

The Confirmation of Feasibility (COF) states that sufficient capacity is available in the IW network to facilitate a wastewater connection of 330 units. IW have advised that in order to facilitate the wastewater connection, it will be required to upgrade approximately 150m of foul sewer on the Old Whitechurch Road from 225mm to 300mm at a minimum. It is likely that further sewer network upgrades will be required downstream, IW have been consulted in order to agree a high-level solution for any further works and they have confirmed these works will consist of upsizing the existing pipe diameters only. The works will be in public roads and will not involve provision of infrastructure that would require planning approval. Agreement on the optimum procurement methods for the provision of this infrastructure can be a matter for later detailed agreement with Irish Water.

In the meantime, a first phase of 100 housing units can be connected without any sewer upgrade requirements. Further discussions with Irish Water have confirmed that the upgrade of the existing foul sewer will be carried out by Irish Water on foot of a Connection Application for the development in due course and will be timed to serve the construction of the various phases of the development.

## 14.4 Site Investigation

### 14.4.1 Ground Investigation

A ground investigation was carried out to establish subsurface conditions at the proposed project site by Priority Geotechnical Ltd between August to September 2019 and between January and February 2021.

A summary of ground investigation carried out is provided below with detailed assessment of the findings provided in Chapter 13: Land, Soils, & Geology.

As detailed in Chapter 13: Land, Soils & Geology – Topsoil was encountered with an average thickness of 0.3m, Made Ground was encountered in the eastern section of the site generally ranging from 1.0-4.9m bgl. Granular Glacial Till was encountered during the ground investigations at thicknesses ranging from 0.20 m to ≥2.70 m. Bedrock was encountered at depths ranging from 0.7 m bgl to 3.9 m bgl, and in some places is at >4.9 m bgl. The bedrock is predominantly described as weathered shale, and in one locality as broken purple siltstone and sandstone at a depth of 1.40 m bgl.

| Contractor | Description of Investigation | Details of Investigation |
|---|---|---|
| Priority Geotechnical Ltd | Kilbarry Lands, Cork<br>Ground Investigation<br>Report No. P19129<br>P21016 | 2 Cable Percussion Boreholes (BH01, BH02)<br>25 Trial Pits (TP01 to TP25)<br>*In-situ* tests including standard penetration tests<br>- 9 Standard Penetration Tests<br>- 10 Hand Vane Tests<br>Associated sampling<br>Associated lab testing<br>- 17 Natural Moisture Content tests<br>- 4 Atterberg Limits tests<br>- 15 Particle Size Distribution tests<br>- 1 MVC test<br>- 3 CBR tests<br>- 3 Proctor Compaction tests<br>- 10 pH tests<br>- 10 Sulphate tests<br>- 7 Total Sulphur tests<br>- 2 Organic Matter tests<br>- 6 LOI tests<br>- 5 Environmental analyses<br>Associated reporting |
| Priority Geotechnical Ltd | Kilbarry Lands, Cork<br>Ground Investigation<br>Report No. P19129<br>P21016 | 7 soakaways tests |

**Table 14.8: Ground Investigation Summary.**

### 14.4.2 Groundwater

Groundwater was encountered in two of the Trial Pits during the 2021 ground investigation, at depths ranging between 1.1mbgl and 2.8mbgl.

| Location | Ground Strike (metres below ground level) | Depth of excavation |
|---|---|---|
| TPIT06 | Trickle 1.1<br>Slow ingress 2.8 | 3.0 |
| TPIT07 | Trickle 1.3<br>Slow ingress 2.1 | 3.0 |

**Table 14.9: Groundwater Investigation Summary.**

## 14.5 Potential Impact of the Proposed Development

### 14.5.1 Do Nothing Scenario

If the proposed development did not proceed, there would be no impact on the underlying aquifer or the current surface water regime at the site.

### 14.5.2 Impacts on Existing Water

**Construction Phase**

*Excavation and pipe-drilling activities*

There is potential for surface water or groundwater to be contaminated with pollutants associated with construction activity. Contaminants such as suspended solids which arises from the excavation and ground disturbance during the construction phase contribute to contamination of the local surface water and groundwater.

The removal of topsoil and localised excavations (Including the excavations of Inert Made Ground/fill) across the site will potentially increase the vulnerability of the underlying groundwater aquifer. However, although the vulnerability rating for the site ranges from high to extreme, as mapped by the GSI, it is likely that this is conservative based on the depth of cohesive material encountered during the site investigation works. It is therefore anticipated that the vulnerability status of the site is not considered likely to increase to a higher vulnerability status.

It is proposed to directionally drill for a section of the proposed stormwater outfall pipe (under the Marsh Fritillary butterfly habitat area as mitigation by design) at depths of between 3.4m and 4.2m below existing ground level. The nature of the construction methodology proposed which will not alter the overburden thickness nor discharge to groundwater (sealed pipe), Consequently there will be no change in vulnerability or groundwater quality.

There will be some excavation in rock for foundations and sewers, with maximum depths of approximately 4.0 m of excavation in rock expected in localised areas to achieve the design levels required for proposed drainage infrastructure.

The impact is considered to be negligible on the groundwater contained within the bedrock aquifer. The impact on the regional groundwater quality is predicted to be negligible in magnitude and imperceptible in significance, temporary in duration and unlikely.

*Accidental spillage*

Accidental oil or fuel spillage during the refuelling of construction plant with petroleum hydrocarbons or leaks from construction materials have the potential to contaminate the soils and groundwater underlying the site. Accidental spillages could contaminate the aquifer by direct percolation or via the superficial water network. Accidental spillage or leaks may result in localised contamination to adjacent water courses, therefore posing risk of reducing water quality of the waterbodies. The potential impact of construction spillage and leaks have a permanent negative impact on the groundwater. The impact of accidental spillages on soils is negligible in magnitude and imperceptible in significance. It may cause short to long-term impacts on groundwater.

*Concrete wash water*

Inappropriate disposal or uncontrolled water runoff of concrete or other cement-based products from construction materials which are highly alkaline and corrosive have the potential to impact the quality of the underlying aquifer. The magnitude of impact is assessed to be temporary, small adverse in magnitude and slight in significance.

*Waste*

Solid (municipal) wastes being disposed or blown into watercourses or drainage systems and wastewater arising from poor on-site toilets and washroom have potential to cause pollution effecting the water quality. The magnitude of impact is assessed to be temporary, negligible and imperceptible in significance.

**Operational Phase**

There will be potential impacts on surface water or groundwater during the operational phase of the development.

*Reduction in recharge area*

The proposed development will result in a reduction of recharge area due to the introduction of impermeable surfaces such as roofs, roads, and hardstanding areas (having low permeability) which severely restrict recharge. However, the reduction in recharge area is insignificant when compared to the overall total recharge area of the aquifer. Furthermore, the site is underlain entirely by 'Locally Important Aquifer' - Bedrock which is Moderately Productive only in Local Zones (Ll). It is considered that the overall impact on the groundwater resource due to reduction in recharge area will be imperceptible.

*Flooding*

Surface water run-off discharge rates from the development sites may be increased due to the increase in the area of impermeable surfaces, shorter flow paths through pipes and reduced roughness co-efficient, however the implementation of SuDS features will maintain runoff rates at, or below, existing greenfield runoff rates. Greater run-off volumes generated by the impermeable surfaces will require stormwater management and storage within the site to provide protection against pluvial flooding events. Surface water management and attenuation storage has been incorporated into the design to safeguard against storm events and the possibility of flooding downstream of the development throughout the lifetime of the development. A flood risk assessment for the proposed development was completed by J B Barry & Partners (see separate Flood Risk Assessment).

To prevent any increased flooding arising from the proposed development, it is proposed to implement SuDS measures in order to limit the discharge from the site to the current greenfield discharge rates. The implementation of these SuDS measures will mitigate the risk of flooding outside of the development site. Therefore, any potential impacts arising from this activity may be characterised as imperceptible and neutral.

## 14.6 Mitigation measures, Monitoring and Residual Impacts

### 14.6.1 Mitigation & Monitoring

**Construction Phase**

The main potential impacts are associated with the Construction Phase of the proposed development. The mitigation measures in relation to the achievement of a high quality of surface water runoff from the development and groundwater protection will ensure that the status of both surface water and groundwater bodies in the vicinity of the site will be at least maintained (see WFD water body status and objectives) regardless of their existing status. The following Best Practice Guidance relating to water control will be adhered to at all stages of construction. CIRIA (Construction Industry Research and Information Association) 2006: Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006) and CIRIA 2006: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2006.

The following mitigation measures will be put in place to minimise and mitigate the potential impacts to the ground and surface water at the site:

- Excavated soils and rock will be temporarily stockpiled and stored away from any ditch or surface water drainage network to prevent any suspended solids from entering same.
- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement areas, where measures will be implemented to capture and treat sediment- laden runoff prior to discharge of surface water at a controlled rate.
- Silt-fences will be installed at upper sides of the existing vegetated areas to the north of the development area to protect the existing watercourse from unintended silt runoff.
- Protection measures will be put in place to ensure that all materials used during the construction phase are appropriately handled, stored, and disposed of in accordance with recognized standards and manufacturer's guidance. Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater.
- Designated impermeable fuelling areas will be constructed. Fuels, oils, solvents, and other chemicals used during construction will be stored within temporary bunded storage in designated areas of the site. Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996 (as amended).
- Refuelling of construction vehicles and hydraulic oils or lubricants to vehicles will take place off-site or in designated hardstanding areas away from surface water drainage in order to minimise the potential contamination of the water environment. Spill kits and drip trays will be kept in the designated areas in the events of spillage during refuelling of the construction vehicles and machineries. All relevant personnel will be fully trained in the use of this equipment. Attention and care to be taken during the refuelling and maintenance operation.
- All concrete batching and mixing activities will be located in areas away from watercourses and drains.
- Concrete batching and concrete wash down or wash out of concrete trucks will take place off site or in a designated area with an impermeable surface and appropriate drainage/interception/collection measures in place. Spills of concrete, cement, grout, or similar materials will not be hosed into drains.
- Discharge from any vehicle wheel wash areas is to be directed to onsite settlement areas, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.

- Regular inspection of surface water run-off and any sediment control measures e.g. silt traps will be carried out during the Construction Phase.
- Regular auditing of construction/mitigation measures will be undertaken e.g. concrete pouring, refuelling in designated areas etc.

**Operational Phase**

The developed site will be predominantly covered in hardstanding. The impermeable surface will minimise the potential influx of any contaminants into soils and underlying groundwater.

Surface water runoff arising on site during the operational phase will be directed to the surface water drainage system and then via an appropriately designed system such as petrol or hydrocarbon interceptor and silt traps that remove the contaminants from runoff prior to discharge to the final outfall point.

Any accidental leak from drainage to car parks or road areas will be discharged through appropriate oil interceptor to the drainage system.

A regular maintenance and inspection programme of the flow control devices, attenuation storage facilities, SuDS measures, gullies and petrol interceptors will be required during the Operational Phase to ensure the proper working of the development's networks and discharges.

Attenuation and nature-based SuDS measures will be provided to ensure that the discharge rate is maintained at greenfield runoff rate. The attenuation facility and SuDS features will accommodate rainfall events up to, and including, the 1-in-100-year storm event with a 10% allowance for further flow increases due to climate change. Surface water runoff from the site will be managed and attenuated to the greenfield runoff rate as recommended in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by SuDS features and Hydro-brake flow control devices, with ground level nature-based features such as swales and tree-pits and underground attenuation tanks, provided to store runoff from a 1 in 100-year return period event.

Due to the various measures including the attenuation systems with hydrocarbon interception and the design of the wider drainage system in line with SuDS, the likelihood of any spills entering the water environment is negligible.

No future surface water monitoring is proposed as part of the proposed project due to the low hazard potential at the development.

Oil interceptor(s) will be maintained and cleaned out in accordance with the manufacturer's instructions.

Maintenance of the surface water and foul sewer drainage systems as per normal urban developments is recommended to minimise any accidental discharges to ground.

The performance of all SuDS features will be monitored by the relevant authorities during the life of the development.

Monitoring of the installed hydro brake, interceptors and gullies will be required to prevent contamination and increased runoff from the site.

### 14.6.2 Residual Impacts of the Proposed Development

An overall analysis of the impacts considering the proposed mitigation measures concludes that all of the potential impacts (both construction and operational impacts) are predicted to be reduced to a neutral quality, imperceptible significance.

## 14.7 Cumulative Impacts

Planning History in the immediate vicinity of Kilbarry SHD Lands is presented below in Table 14.10.

| Application | Description | Outcome/Current Status |
|---|---|---|
| IDA Lands<br>Ref: 18/4633 | Retention of existing hybrid lamp standard located in the carpark of the existing Flextronics facility. | Planning permission was granted on 11th June 2018. |
| Eirgrid, Old Whitechurch Road<br>Ref: 18/37820 | Construction of a new 110kV Gas Insulated Switchgear (GIS) building, located entirely within the footprint of the existing Kilbarry 110 kV Substation, measuring approximately 603.5m2 and 15m in height at the existing Kilbarry 110kV Substation. | Planning permission was granted on the 16th of July 2019 |
| Old Whitechurch Road – Cork City Council Lands | Permission for enabling infrastructural work which includes:<br>• the under-grounding of overhead power and communications lines, which will require the removal of metal masts and wooden poles, and the erection of new 'line cable interface' masts:<br>• the creation of a new junction and improvements on the Old Whitechurch Rd and Old Mallow Rd;<br>• the provision of a spine access/trunk road including ducting for electricity, gas, Eir and Virgin Media;<br>• the provision of water, foul and surface water drainage services for Irish Water and the council;<br>• and connecting existing services to the site including works in the adjacent Kilbarry 110KB substation to facilitate the under-grounding of overhead cables. | Planning permission was granted |

**Table 14.10: Planning History in the Immediate Vicinity.**

Lands with a proposed development zoning in the immediate vicinity of Kilbarry SHD Lands is presented in Table 14.11 below.

| Application | Description |
|---|---|
| Land at Kilbarry Enterprise Centre, Dublin Hill, south of the subject site | • **Zoning Amendment no. 2.50:** ZO10 Light Industry & Related Uses to ZO1 Sustainable Residential Neighbourhoods. |
| Northern Distributor Road | The preferred route for the northern distributor road as confirmed by Cork City Council is north of Delaney Rovers GAA and through the IDA/LDA lands. |
| LDA Lands Kilbarry | IDA lands in Kilbarry to the east of the site have a proposed zoning of Tier 2 Residential and are also designated as a Longer-Term Strategic Development |

**Table 14.11: Lands with a Proposed Zoning in Immediate Vicinity.**

### 14.7.1 Construction Phase

Multiple permissions remain in place for both residential and commercial developments within the vicinity of the development and it is likely more will occur in the Kilbarry area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase.

No significant cumulative impacts on the water environment are anticipated during the construction phase of the development as long as mitigation measures outlined are put in place.

Therefore, the significance of the impact of the proposed development construction activities is imperceptible and is considered not to change in combination with the other projects.

### 14.7.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place and the potential for more future development in the Kilbarry area.

Based on the overall size of the underlying aquifer and measures to protect soil and water quality there will be no overall change on the groundwater body status. No potential for significant cumulative impacts on water – hydrology and hydrogeology in combination with other projects anticipated during the operational phase of Phase proposed development.

All developments will be required to manage sites in compliance with legislative standards for receiving water quality. Therefore, the cumulative impact is concluded to be neutral and imperceptible in relation to water.

## 14.8 Interactions

Water (Hydrology and Hydrogeology) interactions are primarily linked to the environmental factors listed below. These interactions, and the impacts being considered, are identified in the relevant Chapters.

Chapter 13 – Land, Soils & Geology: Risk of Soil Pollution and associated groundwater pollution during the construction phase.

Chapter 12 - Biodiversity: a key environmental interaction with Water is Biodiversity. A series of mitigation measures are proposed in this Chapter 14 – Water of this EIAR document to ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) is of an appropriate standard.

Chapter 16 - Material Assets – Services Infrastructure Report. A key environmental interaction with Water is Material Assets – Services, Infrastructure & Utilities which outlines the existing wastewater and surface water networks capacity to facilitate scheme discharges.

## 14.9 Difficulties in Compiling Information

No difficulties were encountered during the preparation of this chapter of the EIAR.

## 14.10 References

Geological Survey of Ireland National Bedrock Aquifer / Vulnerability Maps – (online).

Government of Ireland, (2009). *The Planning System and Flood Risk Management Guidelines for Planning Authorities*.

EPA, (2022*). Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

National Roads Authority, (2009). *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*.

Office of Public Works (OPW), (2009). *Guidelines for Planning Authorities – The Planning System and Flood Risk Management*.

Office of Public Works Flood Maps (https://www.floodinfo.ie/map/floodmaps/)

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## 15.0 RESOURCES & WASTE MANAGEMENT

**Content** **Page**



**Figures and Tables**

## 15.1 Introduction

### 15.1.1 Chapter Author

This Chapter has been prepared by John Fallon. John Fallon is a Senior Environmental Engineer with J.B Barry & Partners Consulting Engineers who has over 17 years' experience in the geotechnical / environmental sector. John has an honours Degree in Geology from University College Cork (1998), and a MSc in Civil / Environmental Engineering from Trinity College Dublin (2005) and is a Chartered Environmentalist (CEnv) with the Institute of Environmental Science. John's experience includes the coordination and preparation of environmental impact assessment reports for residential, water and road infrastructure schemes.

### 15.1.2 Chapter Context

This section of the EIAR comprises an assessment of the likely impact of the proposed development and the waste generated from the development as well as identifying proposed mitigation measures to minimise any associated impacts. This includes the potential waste generated from excavation, temporary and permanent construction works and operation of the proposed development. A detailed description of the proposed development is outlined and presented in Chapter 4: Project Description.

Construction and demolition waste is included in the Construction and Environmental Management Plan (CEMP) prepared with reference to the *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects (EPA 2021a)* document. The chapter has been prepared in accordance with the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022).

These documents will ensure the sustainable management of waste arising at the development site in accordance with legislative requirements and best practice standards.

## 15.2 Assessment methodology

The assessment of the impacts of the proposed development in relation to the consumption of resources and the generation of waste materials was carried out taking into account the methodology specified in relevant guidance documents. Desktop studies and site visits were conducted in the proposed development site. The desktop study included review of current and future requirements for waste management, including national and regional waste policy, waste strategies, management plans, legislative requirements, and relevant reports.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the *National Waste Statistics*.

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, to reduce the quantity of waste requiring disposal and to promote sustainable waste management practices. Where residual waste was identified it shall be dealt in accordance with the waste hierarchy set out in the *European Commission (Waste Directive) Regulations 2011* (as amended).

### 15.2.1 Legislation and guidance

Waste Framework Directive 2008/98/EC of the European Parliament amended by Directive 2018/851 which is transposed into the national law by European Communities (Waste Directive) Regulations 2011 (as amended) is the relevant legislation.

The Waste Framework Directive outlines a five-step hierarchy (refer to Figure 15. 1) of waste management options;- waste prevention, preparing for re-use, recycling, recovery, and safe disposal.


**Figure 15. 1 Waste Hierarchy (Source: European Commission)**

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, *Waste Action Plan for a Circular Economy - Waste Management Policy in Ireland,* was published in 2020 and shifts focus 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. The need to embed climate action in all strands of public policy aligns with the goals of the European Green Deal.

The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended) which provides for holding, transportation, recovery, and disposal of waste in such a manner that does not result in environmental pollution in an Irish context are observed herein. Furthermore, all material requiring disposal shall be handled in accordance with all local regulations and only permitted Contractors will be allowed remove specifically consented wastes to licensed or permitted facilities in accordance with legislations referred to below.

The Resource & Waste Management section of the EIAR is prepared in accordance with the following guidelines and policy documents:

- European Communities (Waste Directive) Regulations, 2011 (as amended)
- The Waste Management (Permit) Regulations, 1988 (S.I. No 165 of 1998)
- The Waste Management (Collection Permit) Regulations, 2007 (S.I. No. 820 OF 2007) as amended
- The Waste Management (Facility Permit and Registration) Regulations 2007 (as amended)

- The Waste Management Act, 1996 and amendments
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No 147 of 1998)
- Waste Management (Transfrontier Shipment of Waste) Regulations, 1998 (S.I. No. 149 of 1998)
- Circular Economy Programme 2021-2027 (EPA 2021b)
- Ireland's First Whole-of-Government Circular Economy Strategy – Public Consultation on the Proposed Publication of the Strategy (Department for Environment, Climate & Communications (DECC) 2021)
- A new Circular Economy Action Plan for a Cleaner and More Competitive Europe (European Commission 2020)
- Circular Economy Action Plan (European Commission 2015)
- European Commission (2019) European Green Deal
- Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025 (Department of Communications, Climate Action and Environment (DCCAE) 2020)
- A Resource Opportunity – Waste Management Policy in Ireland (Department of the Environmental, Climate and Communications, 2012)
- EU Construction and Demolition Waste Protocol and Guidelines (European Commission 2018)7
- Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects (EPA 2021a)
- Construction & Demolition Waste, Soil and Stone Recovery / Disposal Capacity – Updated report 2020 (Regional Waste Management Offices 2020)
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022)
- National Waste Statistics Web Resource (EPA 2021b)
- Waste Classification – List of Waste and Determining if Waste is Hazardous or non-Hazardous EPA (2015a); amended
- National Hazardous Waste Management Plan 2021 – 2027 (EPA 2021)
- By-product Guidance Note, A Guide to by-products and submitting a by-product notification under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) (EPA, 2020)
- Waste Minimisation in Construction (SPU SP 133), Construction Industry Research and Information Association (CIRIA) 1997
- Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA 2013).
- Southern region – Waste Management Plan 2015 – 2021
- Cork City Council (Segregation, Storage, and Presentation of Household and Commercial Waste) Byelaws, 2019

The strategy for the management of waste from the construction phase is in line with the requirements of the *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects (EPA 2021a)*.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the *Southern Region (EMR) Waste Management Plan 2015 – 2021, the Cork City Council Waste Management (Segregation, Storage and Presentation of Household and Commercial Waste) Byelaws 2019*, and the *EPA National Waste Statistics Web Resource*.

The disposal of waste to the waste management facilities is governed by the *Landfill Directive Council Directive 1999/31/EC* (as amended) on the landfill of waste, which classifies landfills by waste type including Inert, Non-Hazardous and Hazardous Waste.

In Ireland, the Waste classification is based on:

- Commission Decision of 18 December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European parliament and of the Council (2014/955/EEC) [referred to hereafter as 'The List of Waste (LoW)'].
- Waste Classification is also based on Commission Regulation (EU) No 1357/2014 of 18 December 2014, replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives and
- Council Regulation (EU) 2017/997 of 8 June 2017 amending Annex 111 to Directive 2008/98//EC of the European parliament and of the Council as regards the hazardous property HP 14 'Ecotoxic.'

### 15.2.2 Assessment Criteria

The criteria used to assess the potential impacts of the waste generation and management arising from the proposed development has been adopted from the EIAR Guideline Document by EPA 2022 and is outlined in Table 15. 1 below.

| | |
|---|---|
| **Quality of Effects**<br>It is important to inform the non-specialist reader whether an affect is positive, negative, or neutral. | **Positive Effects**<br>A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities) |
| | **Neutral Effects**<br>No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error. |
| | **Negative/Adverse Effects**<br>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). |
| **Describing the Significance of Effects**<br>'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see *Determining Significance*). | **Imperceptible**<br>An effect capable of measurement but without significant consequences. |
| | **Not Significant**<br>An effect which causes noticeable changes in the character of the environment but without significant consequences. |
| | **Slight Effects**<br>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities. |
| | **Moderate Effects**<br>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. |

| | |
|---|---|
| | **Significant Effects**<br>An effect which, by its character, magnitude, duration, or intensity, alters a sensitive aspect of the environment. |
| | **Very Significant**<br>An effect which, by its character, magnitude, duration, or intensity, significantly alters most of a sensitive aspect of the environment. |
| | **Profound Effects**<br>An effect which obliterates sensitive characteristics. |
| **Describing the Duration and Frequency of Effects**<br>'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful. | **Momentary Effects**<br>Effects lasting from seconds to minutes. |
| | **Brief Effects**<br>Effects lasting less than a day. |
| | **Temporary Effects**<br>Effects lasting less than a year. |
| | **Short-term Effects**<br>Effects lasting one to seven years. |
| | **Medium-term Effects**<br>Effects lasting seven to fifteen years. |
| | **Long-term Effects**<br>Effects lasting fifteen to sixty years. |
| | **Permanent Effects**<br>Effects lasting over sixty years. |
| | **Reversible Effects**<br>Effects that can be undone, for example through remediation or restoration. |
| | **Frequency of Effects**<br>Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually). |

**Table 15. 1: Description of Effects**

The seven generalised degrees of effect significance are as provided in Table 3.4 of the EIAR Guideline Document by EPA 2022.

### 15.2.3 Terminology

Note that the terminology used herein is generally 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
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 set out a non-exhaustive list of disposal operations.

### 15.3 Description of Baseline environment

Cork City Council (CCC) is the local authority responsible for setting and administering waste management activities in the area of the Proposed Development. CCC's waste management activities are governed by the requirements set out in the Southern Region Waste Management Plan (SRWMP) 2015-2021. The Proposed Development Site is currently a greenfield site and has no waste management requirements.

The Cork City Council Bye Laws for the Segregation, Storage and Presentation of Household and Commercial Waste 2019 as effective from 1st May 2019 apply in this area. There are a significant number of waste contractors operating in the Cork area who are permitted to collect waste and already service houses and businesses in the Kilbarry area. The licensed waste facilities in the area are shown in **Error! Reference source not found.**.

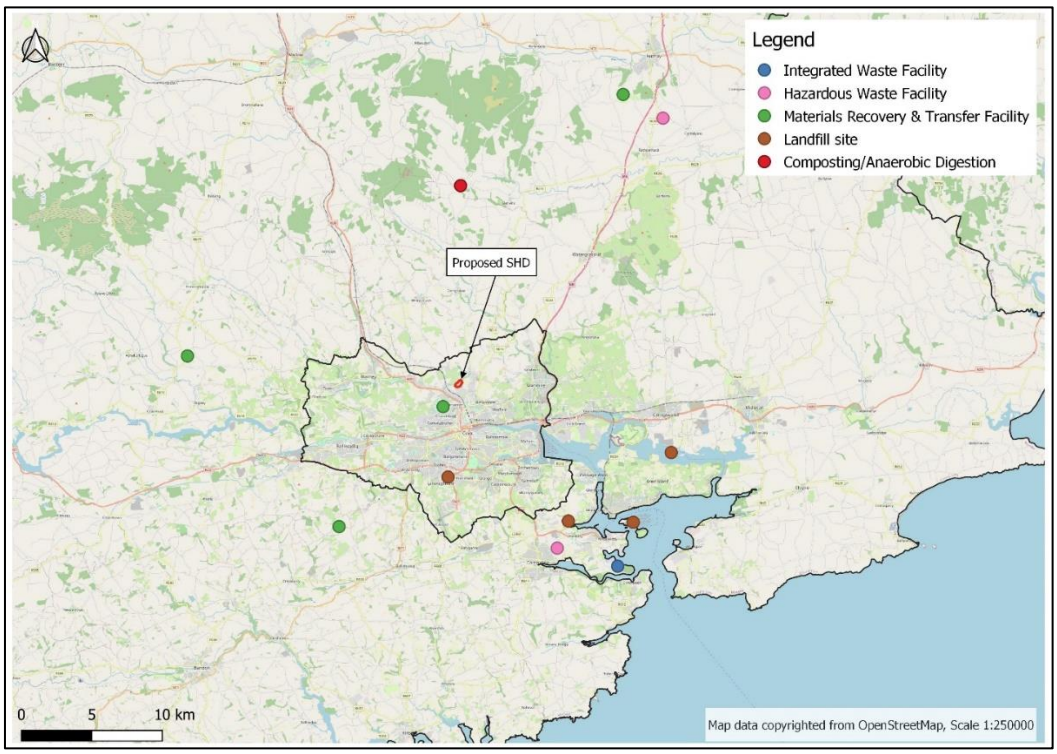


**Figure 15. 2 Waste Facility Permit Holders**

## 15.4 Characteristics of the proposed development

This section of the EIAR assesses waste in the vicinity of a proposed Strategic Housing Development (SHD) on a circa 15.52 hectare site located at Kilbarry, Cork. A detailed description of the proposed development is outlined and presented in Chapter 4: Project Description.

Consideration of the characteristics of the proposed development allows for a projection of the 'level of impact' on any particular aspect of the proposed environment that could arise. This chapter considers the characteristics of the proposed development in terms of waste generated and the potential impact of Waste on the receiving environment is assessed.

### 15.4.1 Demolition Phase

There will be demolition of existing, disused buildings and outbuildings required for this project. All material generated from the construction of the proposed development will be considered for reuse in the construction of the proposed development or in other construction projects in accordance with Article 27 of the *Waste Directive Regulations*. It will be the responsibility of the appointed construction contractor to review feasibility of reuse of materials and ensure that the necessary testing is undertaken to demonstrate compliance with Article 27, as appropriate.

Materials will require on-site segregation by waste classification and if not suitable for reuse, will be delivered to an authorised recycling, recovery, or disposal facility.

The least preferable option is disposal to an authorised facility and will be considered by the contractor when reasonable opportunities for reuse, recycling and recovery are unavailable.

Table 15. 2 shows the estimated quantity and type of waste that will be generated by demolition activities in connection with the proposed development.

| Waste Type | Approx. Waste and Material Quantity (Tonnes) |
|---|---|
| Concrete, bricks, tiles and similar | 700 |
| Metals | 8 |
| Segregated wood, glass, and plastic | 2 |
| **Total** | 710 |

**Table 15. 2: Estimated Demolition Waste Types and Quantities**

### 15.4.2 Construction phase

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. The appointed Contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

**Soil excavation and disposal.**

In addition, topsoil, subsoil, clay and rock will require excavation to facilitate site levelling, construction of foundations, along with the installation of underground services. The overall volume of material to be excavated has been estimated by J. B. Barry and Partners Limited from Ground Investigation and 3D design to be 53,615 $m^3$. Whilst every effort will be made to reuse excavated material onsite, in the creation of proposed roads, platforms for proposed buildings and open space areas, it is expected that approximately 18,071 m3 (including topsoil) of this excavated material will have to be removed off-site as there will be a surplus of this material. This surplus material will be removed from site for appropriate offsite reuse, recovery, recycling and / or disposal.

If the material that requires removal from 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 Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011). For more information in relation to the envisaged management of waste, refer to the CEMP.

**Waste Classification.**

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, 2015* (as amended).

A specialist assessment of the fill material in the existing made ground area and its waste classification was undertaken by Verde Environmental Consultants. Their report (Review of Existing Ground Investigation Data relating to Proposed Residential Development _June 2022) is contained in the Appendix 13.1 of this EIAR. The site investigation and soil sampling results from the site investigations were reviewed, Verde has completed a waste classification exercise using approved HazWasteOnline™ software. The outcome from this exercise confirmed material characterised by the sampling undertaken is non-hazardous and can be appropriated described under List of Waste Code, 17 05 04 (non-hazardous soil and stone). Trial pit logs and associated photographic evidence indicate a generally clean, uncontaminated fill material that would be suitable for on-site reuse.

Results were compared against waste acceptance criteria as defined in Council Decision 2003/33/EC which prescribes waste acceptance criteria for various landfill types and this comparison confirms material would be acceptable at inert landfill facilities. Results are also compared with specific waste acceptance criteria and trigger values for soil waste recovery facilities as published by the EPA in 2020. This comparison indicates that majority of material would be acceptable at soil recovery facilities. Trace PAH was detected in one sample which may be due to the decomposition of plant material associated with the top of an initial filling layer.

Notwithstanding this, 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. It is anticipated that the surplus 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.

**General Waste**

Waste will also be generated from construction phase workers e.g., organic / food waste, dry mixed recyclables (wastepaper, 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.

In order to establish a baseline and review capacity in relation to construction & demolition waste, a review of published data and statistics was undertaken.

In 2019, the latest year for which there are published statistics available, 8.8 million tonnes of construction and demolition waste were generated, an increase of 2.6 million tonnes from 2018 (EPA 2021). Of this waste, 7.5 million tonnes comprised soil and stones, making up 85% of the material waste stream.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project specific Construction and Environmental Management Plan. An estimate of the main waste types likely to be generated during the Construction phase of the proposed development is provided below with a breakdown of the composition of construction and demolition wastes is set out in Table 15. 3 (EPA 2021) (excluding soil excavation above).

| Waste Materials | Quantity (Tonnes) | Reuse | | Recycle | | Disposal | |
|---|---|---|---|---|---|---|---|
| | | % | Tonnes | % | Tonnes | % | Tonnes |
| Mixed waste | 715 | 10 | 71.5 | 80 | 572 | 10 | 71.5 |
| Plasterboard | 217 | 30 | 65.1 | 60 | 130.2 | 10 | 21.7 |
| Concrete, bricks, tiles, and similar | 130 | 30 | 39 | 65 | 84.5 | 5 | 6.5 |
| Metals | 172 | 5 | 8.6 | 90 | 154.8 | 5 | 8.6 |
| Timber | 607 | 40 | 242.8 | 55 | 334 | 5 | 30.4 |
| Other | 326 | 20 | 65.2 | 60 | 195.6 | 20 | 65.2 |
| Total | 2167 | | 492.2 | | 1471.1 | | 203.9 |

**Table 15. 3: Estimates of Construction Wastes**

The model methodology is based on the recent published data and data from numerous other similar developments in Ireland, therefore, it is a more representative estimate of the likely waste arisings from the development.

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the C&D waste that will be generated from the construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

### 15.4.3 Operational phase

During the operational phase of the proposed development waste will be generated within the residential buildings and creche including dry mixed recyclables, organic waste, mixed non-recyclables waste. The dry mixed recyclables will include waste glass, batteries, WEEE, textiles and furniture

The estimated waste generation during operational phase for the development for the main waste types is presented in Table 15. 4.The estimated quantum/volume of waste that will be generated from the residential units has been determined based on the predicted occupancy of the units.

| Waste Type | Waste Volume ($m^3$/week) | |
|---|---|---|
| | Residential Units (Combined) | Crèche |
| **Organic Waste** | 6.34 | 0.05 |
| **Dry Mixed Recyclables** | 43.38 | 1.91 |
| **Glass** | 1.22 | 0.01 |

| Waste Type | Waste Volume ($m^3$/week) | |
|---|---|---|
| | Residential Units (Combined) | Crèche |
| **Mixed Non-Recyclables/ Municipal Waste** | 25.22 | 0.05 |
| **Total** | **76.16** | **2.82** |

**Table 15. 4: Estimated Waste Generation During Operational Phase**

The residents will be encouraged to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the residents. As required, the residents will need to bring these segregated wastes from their units to their waste receptacles for collection by approved waste collection contractors.

## 15.5 Potential impacts of the proposed development

### 15.5.1 Do nothing scenario

If the Proposed Development was not to go ahead there would be no demolition, excavation, construction, or operational waste generated at this site. There would be a neutral effect on the environment.

### 15.5.2 Proposed development

This section details the potential waste impacts associated with the proposed development.

**Construction phase**

The proposed development will generate a range of waste materials during site excavation and construction. Working staff and contractors will also generate waste materials, 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.

A specialist assessment of the fill material in the existing made ground area and its waste classification was undertaken by Verde Environmental Consultants. Their report (Review of Existing Ground Investigation Data relating to Proposed Residential Development _June 2022) is contained in the Appendix 13.1 of this EIAR. The site investigation and soil sampling results from the site investigations were reviewed, Verde has completed a waste classification exercise using approved HazWasteOnline™ software. The outcome from this exercise confirmed material characterised by the sampling undertaken is non-hazardous and can be appropriated described under List of Waste Code, 17 05 04 (non-hazardous soil and stone).

There is a quantity of excavated material which will need to be excavated to facilitate the proposed development. It is anticipated that 53,615 $m^3$ of soil, gravel, clay and rock will be excavated to facilitate the proposed development and it is envisaged that 35,544 $m^3$ of excavated material will be reused onsite as structural/non-structural fill and fill for landscaping.

Approximately 18,071 $m^3$ of material will need to be removed off-site as there will be a surplus of material after excavation. As detailed above, the removal of surplus soil offsite will be undertaken in accordance with applicable statutory requirements. This may include, wherever suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011 (S.I. No 126 of 2011). Material will only be moved under an Article 27 By-product notification when it can be robustly demonstrated that all tests for Article 27 By-product are met.

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. The Construction Phase of the Proposed Development will result in an increase in demand for waste collections and waste treatment in the area. Due to the nature of this phase, the impact will be temporary, negative, and moderate in the absence of mitigation.

**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, moderate and negative.

## 15.6 Mitigation measures and Monitoring

### 15.6.1 Mitigation measures

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.

**Construction phase**

The following mitigation measures will be implemented during the construction phase of the Proposed Development:

A Construction and Demolition Resource and Waste Management Plan (C&D RWMP) will be prepared, and this will be implemented by the appointed contractor in line with the *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects (EPA 2021a)*.

The C&D RWMP outlines how waste arising during the demolition and construction phases of the proposed development will be managed in a way that ensures compliance with the provisions of the Waste Management Acts, 1996, as amended. The appointed contractor will update the C&D RWMP in advance of construction commencement.

Adherence to the high-level strategy presented in this C&D RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and construction phases of the Proposed Development.

A quantity of soil, stone, gravel, clay and rock will need to be excavated to facilitate the proposed development. It is estimated that 35,544 $m^3$ of excavated material will be reused on the site as structural/ non-structural fill and for landscaping. Approximately 18,071 $m^3$ of material will need to be removed off-site as there will be a surplus of material after excavation.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste'.
- On-site segregation of waste materials will be carried out 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
- Glass
- 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 Waste Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition, 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 Article 27 of the *EC (Waste Directive) Regulations (2011)*. 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*, and the *Southern Region Waste Management Plan 2015 – 2021*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

**Operational phase**

Maintenance operations will be undertaken under the jurisdiction of the local authority and in accordance with their waste management plans. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the *Southern Region Waste Management Plan 2015 – 2020* and *Cork City Council (Segregation, Storage, and Presentation of Household and Commercial Waste) Byelaws, 2019*.

In addition, the following mitigation measures will be implemented:

- The residents will be encouraged to ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):
  - Organic waste
  - Dry mix Recyclables
  - Mixed non-recyclable waste
  - Glass
  - Waste electrical and electronic equipment (WEEE)

- Batteries (non-hazardous and hazardous)
- Cooking oil
- Light bulbs
- Cleaning chemicals (pesticides, paints, adhesive, resins, detergents, etc.)
- Furniture (and from time-to-time other bulky waste) and
- Abandoned bicycles

The development will be taken in charge by the Local Authority or will be managed by a Management Company or by a combination of both such that residents will be provided with colour coded bins or other suitable receptacles to assist with segregation of wastes.

The Local Authority and Management Company will ensure that all waste collected from the site of the proposed development will be reused, recycled, or recovered, where possible.

The Local Authority and Management Company will ensure that all waste leaving the site will be transported by suitable, permitted contractors and taken to suitably registered, permitted, or licensed facilities.

Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be long term, imperceptible and neutral.

### 15.6.2 Monitoring measures

The management of waste during the construction phase will be monitored by the Contactor's appointed Waste Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

**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 demolition, excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e., progress and meeting construction schedule targets. The C&D RWMP specifies the need for a Waste 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 Waste 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.

**Operational phase**

Monitoring of the waste generated during the operational phase will be carried out to determine its appropriate suitability for re-use, recovery, or disposal offsite.

Such monitoring will be carried by the Management Company as part of its legal responsibilities and by the Local Authority under its remit under waste legislation.

### 15.6.3 Residual Impacts of the proposed development

The implementation of the mitigation measures outlined in Section 15.6 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. This will also assist with pest control through the various phases of the development. 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.

**Construction phase**

The management of waste during the construction phase in accordance with the CEMP will meet the requirements of regional and national waste legislation. The residual effect of demolition, excavation and general construction waste on the environment during the construction and demolition phase will be short term, imperceptible and neutral.

**Operational phase**

During the operational phase, a structured approach to waste management as set out in Section 15.6 will promote resource efficiency and waste minimization. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be long term, imperceptible and neutral.

## 15.7 Cumulative Impacts

Planning History in the immediate vicinity of Kilbarry SHD Lands is presented in Table 15. 5 below.

| Application | Description | Outcome/Current Status |
|---|---|---|
| IDA Lands<br>Ref: 18/4633 | Retention of existing hybrid lamp standard located in the carpark of the existing Flextronics facility. | Planning permission was granted on 11th June 2018. |
| Eirgrid, Old Whitechurch Road<br>Ref: 18/37820 | Construction of a new 110kV Gas Insulated Switchgear (GIS) building, located entirely within the footprint of the existing Kilbarry 110 kV Substation, measuring approximately 603.5m2 and 15m in height at the existing Kilbarry 110kV Substation. | Planning permission was granted on the 16th of July 2019 |
| Old Whitechurch Road – Cork City Council Lands | Permission for enabling infrastructural work which includes:<br>• the under-grounding of overhead power and communications lines, which will require the removal of metal masts and wooden poles, and the erection of new 'line cable interface' masts: | Planning permission was granted |

| Application | Description | Outcome/Current Status |
|---|---|---|
| | • the creation of a new junction and improvements on the Old Whitechurch Rd and Old Mallow Rd;<br>• the provision of a spine access/trunk road including ducting for electricity, gas, Eir and Virgin Media;<br>• the provision of water, foul and surface water drainage services for Irish Water and the council;<br>• and connecting existing services to the site including works in the adjacent Kilbarry 110KB substation to facilitate the under-grounding of overhead cables. | |

**Table 15. 5 Planning History in Immediate Vicinity of the Site of the Proposed Development**

Lands with a proposed development Zoning in the immediate vicinity of Kilbarry SHD Lands are presented in Table 15. 6 below.

| Application | Description |
|---|---|
| Land at Kilbarry Enterprise Centre, Dublin Hill, south of the subject site | • **Zoning Amendment no. 2.50:** ZO10 Light Industry & Related Uses to ZO1 Sustainable Residential Neighbourhoods. |
| Northern Distributor Road | The preferred route for the northern distributor road as confirmed by Cork City Council is north of Delaney Rovers GAA and through the IDA/LDA lands. |
| LDA Lands Kilbarry | IDA lands in Kilbarry to the east of the site have a proposed zoning of Tier 2 Residential and are also designated as a Longer-Term Strategic Development |

**Table 15. 6 Lands with a proposed development Zoning in the Immediate Vicinity of the Site of the Proposed Development**

### 15.7.1 Construction phase

Multiple permissions remain in place for both residential and commercial developments within the vicinity of the development and it is likely more will occur in the Kilbarry area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase. Due to the high number of waste contractors in the Cork City region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative effects associated with waste generation and waste management. As such the effect will be short-term, not significant, and negative.

### 15.7.2 Operational phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place and the potential for more future development in the Kilbarry area. 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 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.

## 15.8 Interactions

The management of waste during the construction and operational phase in accordance with C&D RWMP will meet the requirements of regional and national waste legislation

### 15.8.1 Land and Soils

During the construction phase excavated soil and stone (c. 53,615 $m^3$) will be generated from the excavations.

It is envisaged that 35,544 $m^3$ of the excavated soils and stones will be reused on site with remaining 18,071$m^3$ taken offsite it will be taken for reuse or recovery, where practical, with disposal as last resort. Adherence to the mitigation measures in Chapter 13 of this EIAR and the requirements of the C&D WMP, will ensure the effect is long-term, imperceptible, and neutral.

### 15.8.2 Traffic

Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the surrounding area.

### 15.8.3 Biodiversity

The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity.

### 15.8.4 Water (Hydrology & Hydrogeology)

The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on Hydrology and Hydrogeology.

### 15.9 Difficulties encountered

There were no difficulties encountered during the production of this chapter of the EIAR.

### 15.10 References

*A Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025 (*Department of Communications, Climate Action and Environment (DCCAE) 2020)

*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects* (EPA 2021a)

*Construction & Demolition Waste, Soil and Stone Recovery / Disposal Capacity – Updated report 2020* (Regional Waste Management Offices 2020)

*Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA 2022)

*National Waste Statistics Web Resource* (EPA 2021b)

*Waste Classification – List of Waste and Determining if Waste is Hazardous or non-Hazardous EPA* (2015a); *amended*

*By-product Guidance Note, A Guide to by-products and submitting a by-product notification under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011)* (EPA, 2020)

*Southern region – Waste Management Plan 2015 – 2021*

*County Cork Waste Management Byelaws, 2019*

## 16.0 MATERIAL ASSETS - SERVICES, INFRASTRUCTURE AND UTILITIES



**Figures, Tables, Appendices**

## 16.1 Introduction

### 16.1.1 Chapter Author

This chapter has been prepared and drafted by Ray Sheehan of JB Barry & Partners, Consulting Engineers. Ray is a Chartered Civil Engineer and a Senior Engineer with J.B. Barry and Partners with over 20 years' experience in the private sector as a consulting engineer with particular experience in design and construction of infrastructure for residential developments.

### 16.1.2 Chapter Context

This chapter of the Environmental Impact Assessment Report (EIAR) assesses and evaluates the likely significant impacts on the material assets serving the subject lands relating to foul sewage, water supply, gas supply, electricity, and telecommunications. The proposed development consists of the construction of 319 no. residential units and associated ancillary works on a circa 15.52 ha site located at Kilbarry, Cork.

In this chapter the characteristics of the potential impacts during the Construction and Operational phase are discussed and assessed. Appropriate mitigation measures to limit any significant impacts to Services, Infrastructure and Utilities are recommended and any residual impacts are also identified.

### 16.1.3 Methodology

**Guidance**

The Material Assets - Services, Infrastructure and Utilities section of the EIAR is prepared in accordance with the following guidelines:

- Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Environmental Impact Assessment of Projects Guidance on Scoping 2017
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA (2017)

**Assessment methodology**

The scope of the work for the assessment involved undertaking a Desk Study, a Site Walkover, site surveys and investigations.

During the Desk Study, information on the relevant existing material assets associated with the development was derived from the following sources:

- Irish Water records;
- Cork County and Cork City Council records;
- ESB Networks records;
- Gas Networks Ireland records;
- EIR records;
- Consultations with Irish Water, Cork City and Cork County Council;
- Topographical survey;
- Site Investigations data;

- Site walkover;

Projections of Built Services use, and potential interference will be made, for both construction and operational phases of the development, and the impacts are assessed.

The methodology used to determine likely significant effects on Material Assets and the referenced impact criteria have been developed by the specialist in consideration of the EPA guidelines. Using established best practice and professional judgement, the significance of impact on Material Assets - Services, Infrastructure and Utilities is based on the criteria developed in Table 16.1.

| Importance | Criteria |
|---|---|
| **Profound** | Profound impact occurs where there is a permanent disruption to a utility service or where there is significant surcharging of an existing system |
| **Major** | Major impact occurs where there is a long-term disruption to a utility service or where there is minor surcharging of an existing system |
| **Moderate** | Moderate impact occurs where there is a medium-term disruption to a utility service or where there is significant increase of flow within an existing system |
| **Slight** | Slight impact occurs where there is a short-term disruption to a utility service or where there is a minor increase of flow within an existing system |
| **Imperceptible** | Imperceptible impact occurs where there is a temporary disruption to a utility service or where there is a no quantifiable increase of flow within an existing system |

**Table 16. 3 Material Assets - Services, Infrastructure and Utilities Impact Significance Criteria**

## 16.2 Description of Existing Baseline Environment

### 16.2.1 Surface Water Drainage

There is no existing formal surface water network within the proposed development site. There is an existing 225mm diameter Cork City Council storm sewer in the Old Whitechurch Road to the south-west of the site. The head of the run is located close to the junction with the Bridgefield Estate, and it runs in a north-south direction. See figure 16.1 for the storm sewer location.

The invert level and distance to the sewer does not allow connection from the development site by gravity so all discharges of stormwater will be to the Glenamought River/River Bride to the north of the site.

### 16.2.2 Foul Water Drainage

There is no formal foul water network within the proposed development site. There is an existing 225mm diameter public foul sewer in the Old Whitechurch Road to the west of the site. This sewer runs in a north-south direction eventually discharging to the Railway Yard Wastewater Pumping Station in Cork City. See figure 16.1 for the foul sewer location.

From the pumping station the flows are pumped to the to Carrigrennan Wastewater Treatment plant. See Appendix 16-1 for Irish Water maps of locations mentioned above.

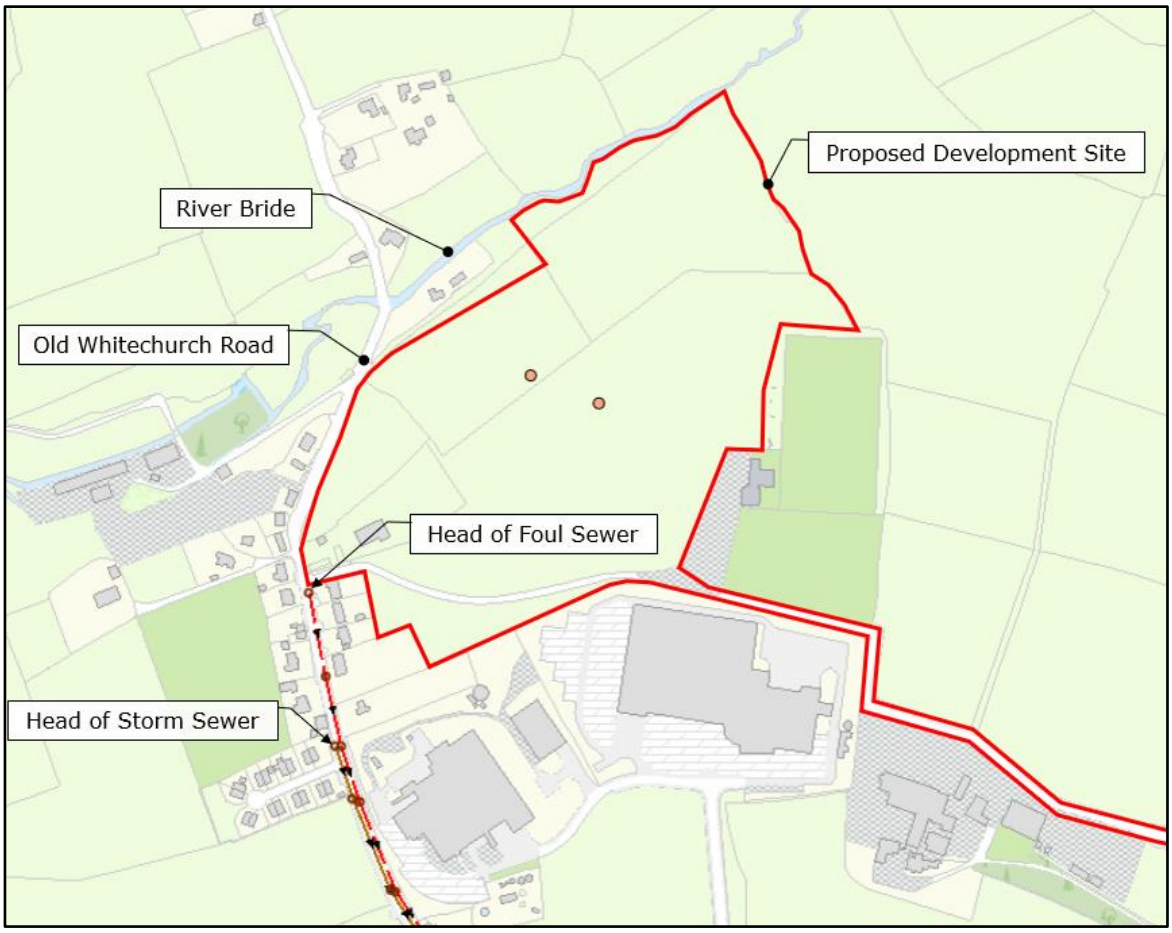


**Figure 16.1 – Existing Foul and Storm Water Networks**

### 16.2.3 Potable Water

Existing watermains within and in the vicinity of the site are depicted in Figure 16.2.

The water main records indicate there is a 150mm diameter ductile iron watermain in the Old Whitechurch Road to the west of the site. This main runs north to south before turning in a westerly direction and increasing downstream to a 300mm diameter main.

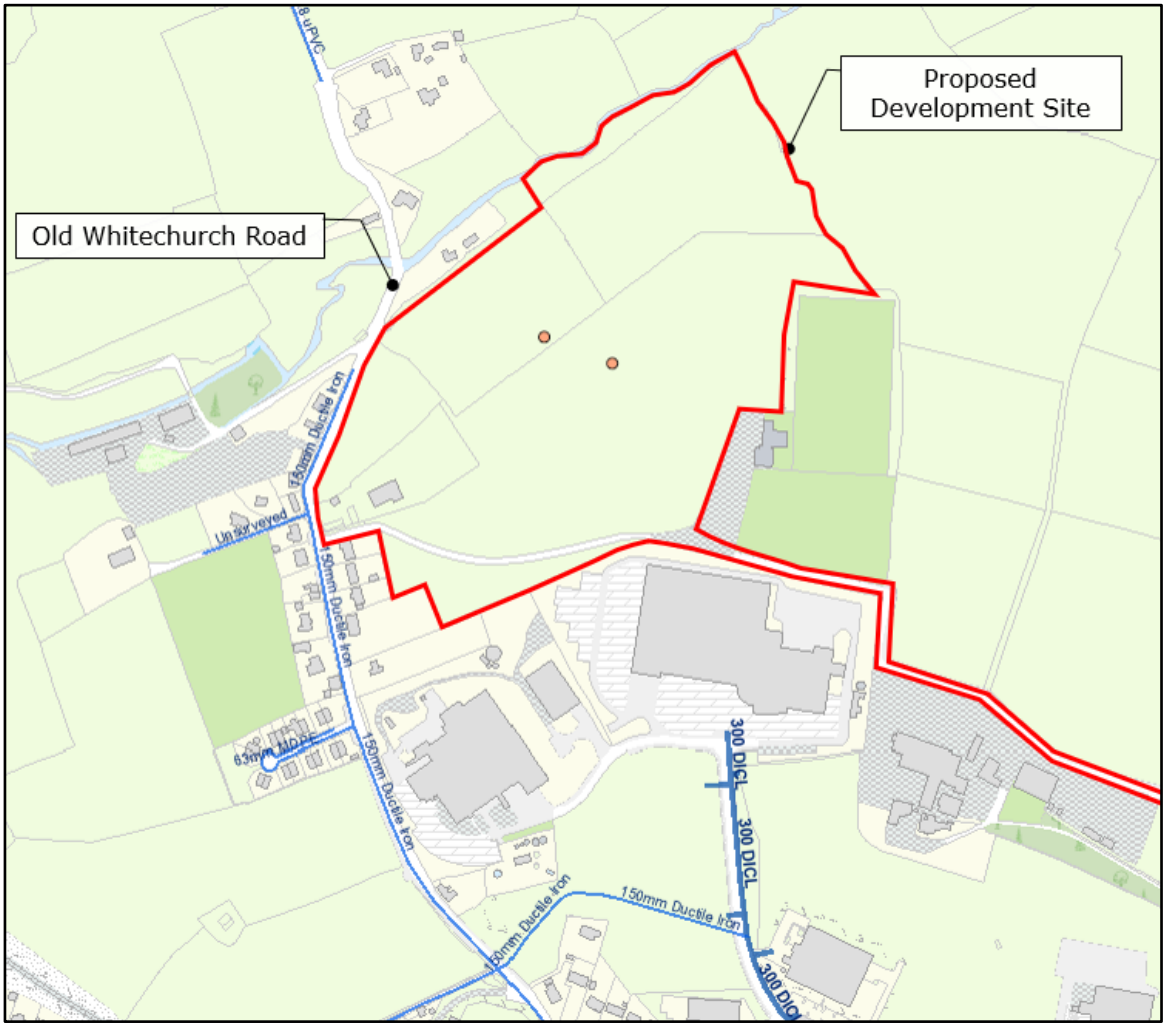


**Figure 16.2 – Existing Watermain Network**

### 16.2.4 Power

From utility maps received from ESB Networks (see Appendix 16-2), the existing dwellings on the Old Whitechurch Road are served by an overhead LV network. There is an overhead MV network traversing the site on a south-west to north-east axis. To the east of the site there is a 38KV underground power supply which runs through the Delaney's GAA grounds before entering the site. It remains underground for approximately 30m before going overground from a pylon.

### 16.2.5 Gas

From utility maps received from Gas Networks Ireland (see Appendix 16-3), there is a gas supply serving the existing dwellings in the Old Whitechurch Road which terminates approximately 120m south of the proposed entrance to the development site. The network in the area is a medium pressure network.

### 16.2.6 Telecommunications

From utility maps received from EIR (see Appendix 16-4), there are telecommunications networks serving the existing dwellings along the Old Whitechurch Road. Delaney's GAA club to the east of the site is fed from a separate network to the east.

Also, from the Department of Environment, Climate and Communications online mapping the area surrounding the proposed development is serviced by High-Speed Broadband.

## 16.3 Characteristics of the Proposed Development

### 16.3.1 Phase 1

In summary, the proposed development consists of construction of a mixed-use residential development of 319 residential dwellings comprising of the following;

- 25 no. 4-bedroom units
- 130 no. 3-bedroom units
- 119 no. 2-bedroom units
- 45 no. 1-bedroom units

A detailed description of the proposed development is contained in Section 4 of the EIAR.

**Surface Water Drainage**

The proposed surface water network will include a storm drainage pipe network, attenuation storage and several SuDS features which will aid the reduction of runoff volumes by slowing surface water flows, providing the opportunity for evapotranspiration and providing the opportunity for infiltration to ground. The restricted discharge from the site will discharge to the Glenamought River/River Bride to the north of the site. See drawings 19215-JBB-00-XX-DR-C-04000 - 4003 for details.

**Foul Water Drainage**

Wastewater collection within the proposed development will be via a network of 150mm and 225mm diameter gravity sewers, which will direct the flows to the western boundary of the site and will connect directly to the foul sewer in the Old Whitechurch Road. See drawings 19215-JBB-00-XX-DR-C-04000 - 4003 for details.

Foul Water from the proposed development will ultimately discharge to the Carrigrennan WWTP for treatment and disposal. This discharge will incrementally increase over a four to five-year period as the development is completed and occupied with a final estimated daily discharge of 146 $m^3$/day.

The above demand assessments are based on Irish Water's design parameters for domestic housing as follows:

- Average occupancy = 2.7 persons/dwelling
- Per-capita consumption = 150 litres/person/day
- Peaking factor = 6
- Infiltration = 10% of unit consumption

And for commercial premises as follows;

- Per-capita consumption Creche = 50 litres/person/day
- Peaking factor = 4.5
- Infiltration = 10% of unit consumption

A Pre-Connection Enquiry was submitted to Irish Water, the response to which confirmed that the proposed development can be serviced by the existing wastewater infrastructure network in the area. A copy of the confirmation is included in Appendix 16-5.

The Confirmation of Feasibility (COF) states that sufficient capacity is available in the IW network to facilitate a wastewater connection of 330 units. IW have advised that in order to facilitate the wastewater connection, it will be required to upgrade approximately 150m of foul sewer on the Old Whitechurch road from 225mm to 300mm at a minimum. It is likely that further sewer network upgrades will be required downstream.

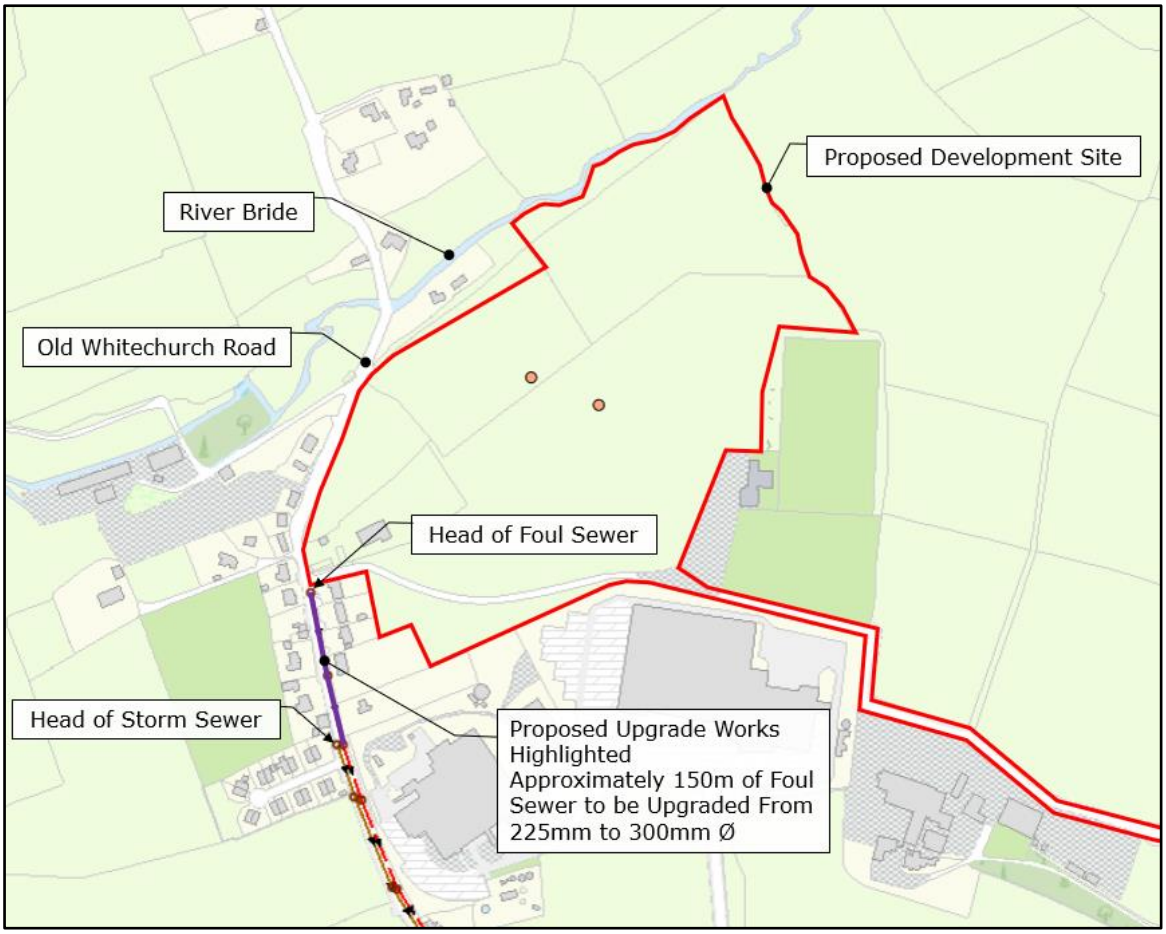


**Figure 16.3 – Proposed Foul Sewer Upgrade**

IW have been consulted in order to agree a high-level solution for any further works and they have confirmed these works will consist of upsizing the existing pipe diameters only. The woks will be in public roads and will not involve provision of infrastructure that would require planning approval. Agreement on the optimum procurement methods for the provision of this infrastructure can be a matter for later detailed agreement with Irish Water.

Irish Water have an ongoing project to survey and model the sewer networks in the Cork City area. When these studies are complete the scope of the upgrades will be fully known. In the meantime, a first phase of 100 housing units can be connected without any sewer upgrade requirements.

Gravity sewers are designed using Micro-Drainage WINDES design software to ensure self-cleansing velocities will be achieved on all pipe runs.

The proposed foul water drainage system has been designed and will be constructed in accordance with the requirements of Irish Water and will comply with the following:

- 'Code of Practice for Wastewater Infrastructure' (Irish Water);
- 'Wastewater Infrastructure Standard Details' (Irish Water);
- Building Regulations, Technical Guidance Document Part H 'Drainage and Waste Water Disposal'; and
- IS EN752, "Drain and Sewer Systems Outside Buildings";

Odours will be generated within the foul drainage system and will require venting in accordance with Irish Water standard details which will ensure the odour issue is an imperceptible impact at the connection point to the existing foul sewer network.

**Potable Water**

A 150mm diameter ductile iron watermain is located in the Old Whitechurch Road to the west of the development site.

A Pre-Connection Enquiry was submitted to Irish Water, the response to which confirmed that the proposed development can be serviced by the existing water infrastructure network in the area. A copy of the confirmation is included in Appendix 16-5.

The Confirmation of feasibility states that sufficient capacity is available in the IW network to facilitate a water connection of 330 units. IW have advised that the connection is to be made via a 250mm diameter watermain to the 300mm watermain in the Kilbarry Business Park to the south. This can be done by upgrading approximately 750m of watermain on the Old Whitechurch road to 250mm or finding another route with a wayleave through the adjoining business park. An initial phase of approximately 100 houses can be connected without upgrade requirements.

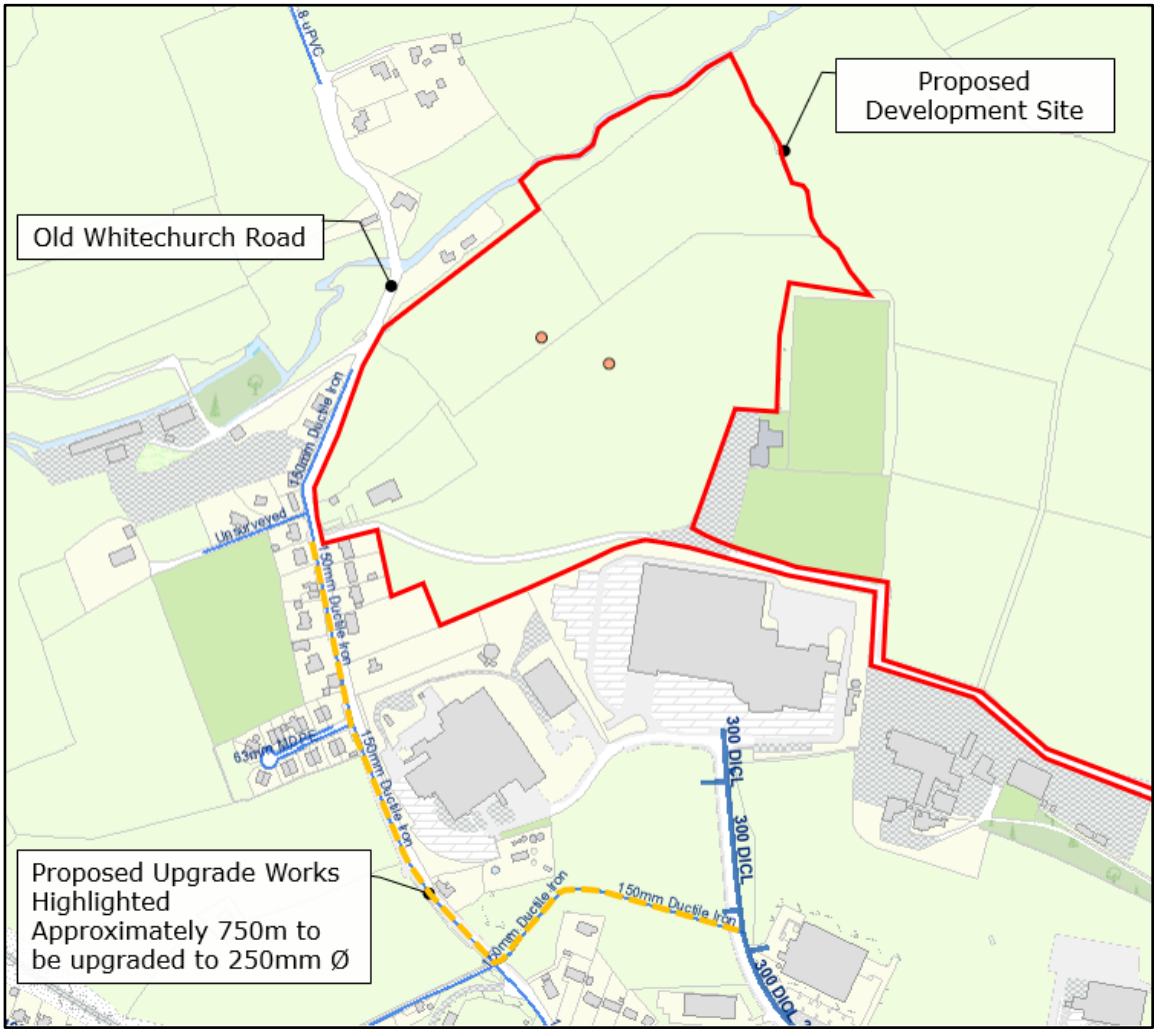


**Figure 16.4 – Proposed Watermain Upgrade**

The proposed water supply system has been designed and will be constructed in accordance with the requirements of Irish Water and will comply with the following:

- 'Code of Practice for Water Infrastructure' (Irish Water);
- 'Water Infrastructure Standard Details' (Irish Water); and
- Building Regulations, Technical Guidance Document Part B 'Fire Safety';

See drawings 19215-JBB-00-XX-DR-C-03000 - 3003 for details.

This increase in water supply demand will happen incrementally over a four to five-year period as the housing development is completed and occupied with an estimated ultimate daily demand of 161 $m^3$/day.

The above demand assessment is based on Irish Water's design parameters as follows:

- Average occupancy = 2.7 persons/dwelling
- Per-capita consumption = 150 litres/person/day
- Average day / peak week demand factor = 1.25

The demand assessment is rather conservative as the above parameters are applied to all residential units i.e., 1, 2, 3 and 4 bedrooms.

The new site watermain network has been designed to adequately serve the firefighting requirements of the development.

Fire hydrants will be provided such that each building will be within 45m of a hydrant and these hydrants will be provided so as to be fully accessible to the fire service.

Sluice valves will be installed on all principal watermain connections to ensure that sections of the development can be isolated for maintenance and repair as required.

A water-meter will be installed on the main connections, subject to detailed agreement with Irish Water/Cork City Council.

**Power**

Power supply, and the requirement for any alterations to the existing power supply network for the development of the site, will be agreed with ESB Networks in advance of construction. All power supply related works will be carried out in accordance with ESB Networks relevant guidelines. It is estimated that at a minimum 4 sub stations will be required to be supplied subject to ESB calculations, geography, routing, etc.

**Gas**

All current energy analysis for the development have been based on electric heat pumps. Although not totally excluded it is unlikely a gas supply will be required. To the west of the site, there is an existing medium pressure pipe that could supply the development if required. If it is required any alterations to the existing gas supply network for the development of the subject site, will be agreed in advance of construction with Gas Networks Ireland. All gas supply related works will be carried out in accordance with Gas Networks Ireland relevant guidelines.

**Telecommunications**

The existing infrastructure serving the housing to the west of the development, shall be extended into the proposed development as is normal practice for developments of this type. The development will install, in ground, vendor neutral ducting to allow for any user to be provided by any vendor. Access to the ducts will be by means of manhole cover junction relay boxes, mounted in ground.

Telecommunications supply, and the requirement for any alterations to the existing telecommunications network for the proposed development, will be agreed in advance of construction with the relevant telecommunications providers. All telecommunications related works will be carried out in accordance with relevant guidelines.

## 16.4 Potential Impact of the Proposed Development

### 16.4.1 Do nothing Scenario

In the 'do nothing' scenario, the subject lands will remain undeveloped and there are no predicted impacts on these material assets.

### 16.4.2 Construction Phase

**Surface Water Drainage**

The installation of the surface water sewers for the development will be conducted in parallel with the other services. This will mainly involve the construction of the drainage network using trench excavation. The potential adverse impact on the local infrastructure during the construction phase of the development would therefore be temporary and imperceptible.

Damage to existing underground and over ground infrastructure resulting in possible contamination of the existing systems (including watercourses) with construction related materials. Any adverse impact would be temporary, short term and slight.

**Foul Water Drainage**

The installation of the foul sewers for the development will be conducted in parallel with the other services. This will mainly involve the construction of the drainage network using trench excavation.

The potential adverse impact on the local infrastructure during the construction phase of the development would therefore be temporary and imperceptible.

The foul sewer for the development will be connected to the existing foul drainage network outside the site. The existing network will require an upgrade to facilitate the proposed development. These upgrade works will be agreed with Irish Water. The potential adverse impact on the local foul drainage network would be short term and slight during the upgrade works.

The site compound will require a temporary foul connection. The likely adverse impact of this connection will be temporary and imperceptible and will be subject to a Connection Agreement with Irish Water.

**Potable Water**

Provision of a new water main distribution network would involve construction activities within the subject lands mainly involving trench excavations conducted in parallel with the other services. The existing water network will require an upgrade to facilitate the proposed development. The potential adverse impact on the local public water supply network would be short term and slight.

There is a risk of a temporary short-term disruption to the quality of local public water supply during the construction of the upgrade works and temporary shutdowns will be required for such works. All such temporary shutdowns will be operated under agreement with Irish Water with appropriate procedures put in place to advise local users of the likely short-term impacts (such as temporary discolouration/temporary water-supply interruptions/etc.).

The site compound will require a temporary water connection. This likely adverse impact of this temporary connection will be temporary and imperceptible and will be subject to a Connection Agreement with Irish Water.

**Power, Gas and Telecommunications**

The installation of the utilities for the development will be conducted in parallel with the other services and will primarily involve construction of ducting and chambers using open excavation. Any adverse impact on the local network would be short term and imperceptible.

The diversion of the overhead power lines to underground ducting will be carried out by ESB under planned outages. As a result, the impact of these works would be temporary, regionally short term, with moderate impact to existing users or to the local electrical grid.

There may also be a potential temporary loss of connection to the ESB infrastructure while carrying out works to provide connection to the proposed development. This likely adverse impact may be characterised as a temporary, regionally short term, moderate impact.

There may be a potential temporary loss of connection to the Gas Networks Ireland infrastructure while carrying out works to provide connection (if one is required) to the proposed development. As there are no gas requirements during the Construction Phase and there will be no connections made to the natural gas network as part of the Proposed Development. As such, the potential impact from the Construction Phase on the gas supply network is likely to be permanently neutral and imperceptible.

There may be a potential temporary loss of connection to the telecommunications infrastructure while carrying out works to provide connection to the proposed development. This likely adverse impact may be characterised as a temporary, locally short term, minimal impact.

The site compound will require a temporary power and telecommunications connection. The likely adverse impact of the provision of this supply will be temporary and negligible.

### 16.4.3 Operational Phase

**Surface Water Drainage**

As discharge to the Glenamought River/River Bride will be at a restricted rate equivalent to the greenfield runoff any impact without mitigation will be permanent but slight.

The increased impermeable areas will reduce local ground water recharge and potentially increase surface water runoff if not attenuated to greenfield runoff rate. Any impact will be permanent and slight without mitigation.

The development could lead to accidental hydrocarbon leaks along roads and subsequent discharge into piped surface water drainage network. Any unlikely adverse impact would be temporary and slight.

**Foul Water Drainage**

The impact of the proposed development on the foul drainage network will be to increase the quantity of foul water entering the collection network and discharging to Carrigrennan WWTP for treatment and disposal. The estimated discharge on completion of the development site is approximately 146 $m^3$/day. The potential impact from the operational phase of the development on the existing wastewater treatment plant at Carrigrennan will be long-term and minimal.

The development will add to the environmental and financial costs associated with treatment and disposal at the Carrigrennan WWTP. Any such impact will be permanent and minimal.

Following a Pre-Connection Enquiry, Irish Water issued a Confirmation of Feasibility for the proposed development. Given that the overall development will take place and become occupied in phases the load on the existing foul sewer network will increase slowly over a period of four to five years, providing the time required for any upgrades, if required. As such the impact of the proposed development on the existing foul sewer network will be long term and minimal.

There exists a minor risk associated with the possibility of leakage from damaged foul sewers and drains within the development site. Any foul water leakage could result in minor contamination of groundwater in the area. Any adverse impact would be temporary and minimal.

**Potable Water**

The impact of the operational phase of the proposed development on the public water supply is likely to be to increase the demand on the existing water supply by approximately 161 $m^3$/day. As such additional water quantities would need to be treated and supplied through the existing network to the site. This will result in extra cost as well as increasing abstraction volumes from the existing source. Any potential impact of the proposed development on the public water supply network is likely to be permanent and minimal.

**Power, Gas and Telecommunications**

The impact of the operational phase of the proposed development on the power supply network would be the requirement for four sub stations to be located on the site.

The impact of the operational phase of the proposed development on the gas supply (if required) would be the requirement for an additional gas load to accommodate the development of the lands. The Proposed Development will not be connected to the natural gas network. Heat Pumps powered by electricity will be used for space heating and domestic hot water during the Operational Phase. As such, the potential impact from the Operational Phase on the gas supply network is likely to be permanently neutral and imperceptible.

The impact of the operational phase of the proposed development on the telecommunications network would be to increase the demand on the existing network.

The potential adverse impact of the proposed development on the Power, Gas and Telecommunications networks is likely to be permanent and minimal.

## 16.5 Mitigation Measures, Monitoring and Residual Impacts

### 16.5.1 Mitigation measures for the proposed development

**Construction Phase**

Mitigation measures proposed in relation to the drainage, water, power, and telecommunications services infrastructure include the following:

- A "Construction and Environmental Management Plan" has been prepared and will be further developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the "Construction Management Plan".
  In order to reduce the risk of defective or leaking sewers, all new sewers will be laid in accordance with Irish Water standards, pressure-tested and CCTV surveyed to ascertain any possible defects before being brought into operation.
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be removed off site to a licensed facility until a connection to the public foul drainage network has been established.
- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.
- The permanent connection to serve the development, will be carried out under an agreed methodology and with full notification to existing Irish Water customers who will be affected by the short-term interruptions to water supply which will occur while making these connections.
- Where possible, backup network supply to any services will be provided should the need for relocation or diversion or existing services be required. Otherwise, relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works.
- Connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.
- The storm sewer network is designed to flow under public roads and open spaces to ensure unimpeded access is available to the pipe network (including hydrocarbon interceptors and silt traps) at all times to allow for monitoring and maintenance.

With appropriate mitigation measures in place, no significant negative impacts on material assets are predicted as a consequence of the construction phase of the development.

Service providers have been and will continue to be consulted throughout the design and construction process. Requirements for each service will be agreed with the respective provider and a representative of the service provider will be present on site as necessary during the works for monitoring purposes.

**Operational Phase**

Mitigation measures proposed during the operational stage include the following:

All new drainage lines (foul and surface water) will be pressure-tested and will be subject to a CCTV survey to identify any possible defects prior to being made operational.

Regular maintenance of the drainage network including the petrol interceptor, flow control and surface water attenuation system will ensure that they are operating correctly.

It is envisaged that the development will take place and be occupied on a phased basis and therefore the downstream foul sewerage system (foul sewer network and wastewater treatment facility) will be loaded gradually and incrementally.

Water conservation methods such as the use of low flush toilets and low flow taps will be incorporated into dwellings to reduce water volumes and related treatment and abstraction costs of the development. Such water conservation methods will reduce the loading on the foul sewer network and the treatment works at Carrigrennan WWTP.

On completion of the construction phase no further mitigation measures are proposed in relation to the electrical, gas and telecommunications infrastructure.

With mitigation measures in place, no significant negative impacts on material assets are predicted as a consequence of the operational phase of the development.

### 16.5.2 Residual Impacts

**Foul Water Drainage**

The development will generate additional foul sewage flows to the existing foul sewage network and municipal wastewater treatment facilities, but the volume of these additional flows is minor in the context of the capacity of the existing network and treatment facilities. Irish Water have provided us with figures (2020) for Carrigrennan WWTP.

- The peak hydraulic capacity at the Carrigrennan WWTP is 359,592 $m^3$/day
- The annual max flow to the WWTP is 266,498 m3/day
- The annual mean flow to the WWTP is 126,805 m3/day
- The Organic capacity at the WWTP is 413,200 PE
- The collected load at the WWTP (peak week) is 241,480 PE

Based on the above there is significant spare capacity at the WWTP to accept the flows from the proposed development.

Following mitigation measures proposed there will be no residual impacts on foul water infrastructure after construction work is completed.

Following mitigation measures proposed the residual impacts on foul water infrastructure during operation are long term but minimal for the existing municipal wastewater treatment plant and long term but minimal for the existing foul sewer network.

**Potable Water**

Potable water will be provided by connecting to the public water mains which are fed from the existing Irish water network. Within the site the water will be distributed via a network of 100mm and 150mm diameter water

main pipes, the design and construction of the network will be in accordance with the Water Supply Code of Practice published by Irish Water. The development will generate additional water demand on the existing water supply network and municipal water treatment facilities, although the volume of these additional flows is minor in the context of the capacity of the existing network and treatment facilities.

The additional demand arising from the development is minor in the context of the capacity of the existing water supply network in the area and therefore the residual impacts on existing potable water infrastructure during the operational phase of the development will be long term but minimal.

**Power, Gas and Telecommunications**

No significant residual impacts from either the construction or operational phases of the development are likely, as a consequence of the connection to the Power, Gas and Telecommunications networks.

## 16.6 Cumulative Impacts

### 16.6.1 Planning in the Immediate Vicinity

The cumulative residual construction and operational impacts of the proposed development and the following projects and plans have been assessed:

### 16.6.2 Recent Planning Applications

The following planning applications have been assessed.

| Application | Description | Outcome/Current Status |
|---|---|---|
| Cork City Council Ref: 18/4633 | Retention of existing hybrid lamp standard located in the carpark of the existing facility | Planning permission granted on 11th June 2018 |
| Cork City Council Ref: 19/38211 | The construction of a new 110kV Gas Insulated Switchgear (GIS) building, located entirely within the footprint of the existing Kilbarry 110 kV Substation, measuring approximately 603.5m2 and 15m in height. | Planning permission granted on the 16th July 2019 |
| Part 8 Application | Carrying out of enabling infrastructural work at their landbank on the Old Whitechurch Road. The Infrastructural works include the following:<br>- The under-grounding of overhead power and communications lines, which will require the removal of metal masts and wooden poles, and the erection of new 'line cable interface' masts<br>- The creation of a new junction and improvements on the Old Whitechurch Rd and Old Mallow Road<br>- The provision of a spine access/trunk road including ducting for electricity, gas, Eir and Virgin Media<br>- The provision of water, foul and surface water drainage services for Irish Water and the Council | Enabling works have commenced and the City Council has issued a request for expressions of interest from developers to become involved in the development of the project. |

| Application | Description | Outcome/Current Status |
|---|---|---|
| | - Connecting existing services to the site including works in the adjacent Kilbarry 110KB substation to facilitate the under-grounding of overhead cables | |

**Table 16. 4 Potential Cumulative Effects (Permitted Proposed Developments)**

### 16.6.3 Proposed Zoning in the Immediate Vicinity

The following zoning amendments to the Draft Cork City Development Plan, 2022, have relevance to the site:

| Area | Zoning Amendment No. | Previously Zoned | Proposed |
|---|---|---|---|
| Subject Site Lands | 2.54 | ZO10 Light Industry & Related Uses | ZO1 Sustainable Residential Neighbourhoods. |
| Subject Site Lands | 2.55 | ZO16 Public Open Space | ZO1 Sustainable Residential Neighbourhoods. |
| Subject Site Lands | 2.56 | ZO17 Sports Grounds & Facilities | to ZO1 Sustainable Residential Neighbourhoods |
| Lands at Kilbarry Enterprise Centre, Dublin Hill | 2.50 | ZO10 Light Industry & Related Uses | ZO1 Sustainable Residential Neighbourhoods. |

**Table 16. 5 Zoning Amendments with Relevance to the Site**

### 16.6.4 Northern Distributor Road

The preferred route for the northern distributor road as confirmed by Cork City Council is north of Delaney Rovers GAA and through the IDA/LDA lands.

Cork City Council have also confirmed that The Strategic Assessment Report (SAR) for the Northern Distributer Road is currently being reviewed by the National Transport Authority. They expect to receive NTA feedback in the coming weeks. Thereafter the SAR will be finalised and resubmitted. This will then be followed by public consultation on the emerging preferred route. The preferred route will then be confirmed following public consultation.

### 16.6.5 LDA Lands at Kilbarry

IDA lands in Kilbarry to the east of the site have a proposed zoning of Tier 2 Residential and are also designated as a Longer-Term Strategic Development whereby a masterplan will be prepared to ensure that the residential zoned lands integrate with the wider Kilbarry area and correlate to the Blackpool-Kilbarry Framework Plan which is to be prepared by Cork City Council. These lands are to be transferred to the LDA for future residential development.

Cumulatively these other proposals do not affect the Material Assets criteria ratings used for the proposed development and will not influence the proposed construction works. The potential for any further impact when considered in combination with other known projects in the immediate area, was found to have no potential for significant cumulative impacts on material assets infrastructure and utilities.

Therefore, the significance of the impact of the development for both construction and operational activities is not significant and is considered not to change in combination with the other projects.

## 16.7 Difficulties in Compiling Information

No difficulties were encountered during the preparation of this chapter of the EIAR.

## 16.8 References

Environmental Protection Agency. "Advice Notes for Preparing Environmental Impacts Statements", (EPA 2015).

Environmental Protection Agency. "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports" (EPA 2017).

Environmental Protection Agency. "Guidelines on the information to be contained in EIS" (EPA 2002).

Environmental Protection Agency (2003) Advice Notes on Current Practices in the Preparation of Environmental Impact Statements. (EPA 2003).

ESB Networks. Code of Practice for Avoiding Danger from Overhead Electricity Lines (ESB 2008).

CIRIA Environmental Good Practice on Site 3rd Edition, (C692), (CIRIA Publications, 2010).

CIRIA Control of water pollution from construction sites, guidance for consultants and contractors, (C532), (CIRIA Publications, 2001).

## 17.0 POPULATION AND HUMAN HEALTH

**Contents**



**Figures, Plates and Tables**

## 17.1 Introduction

This chapter has been prepared by Coakley O'Neill Town Planning Ltd. The lead author is Dave Coakley, Director, Coakley O'Neill Town Planning Ltd, who graduated as a town planner from the University of West England in 2005, and holds the qualifications of BA (Hons), MPhil, MTCP, MIPI, and has worked in the public and private sector in Cork since 2001. Dave has over 20 years professional experience in the field of planning, which has included providing consultancy services in respect of several urban development, infrastructural development, and tourism development including EIA.

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 & 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."*

This chapter addresses potential effects of the proposed residential development scheme at Kilbarry on population and human health. Potential effects of this proposal on population and human health arising from: traffic and transportation; air quality and climate; noise and vibration; landscape and visual; material assets, and; the risk of major accidents and/or disasters, are dealt with in the specific chapters in this EIAR dedicated to those topics.

## 17.2 Assessment Methodology

The application area and surrounds were visited on a number of occasions for the purposes of this assessment. The purpose of the site walkovers was to identify neighbouring industry and dwellings and to assist in the characterisation of land use. Ordnance Survey maps and aerial photography were also examined to assist in this survey.

In addition, a desk-based study of information on employment, education, health, tourism, amenity, and community facilities was completed. Publications and other data sources consulted included;

- Regional Spatial and Economic Strategy for the Southern Region (2020)

- Cork City Development Plan 2022-2028
- Central Statistics Office (CSO) website: www.cso.ie
- Department of Education (DE) website: www.education.ie.

Information was gathered in respect of the demographic and employment characteristics of the resident population within the relevant catchment area, sourced from the 2011 and 2016 Censuses. The Preliminary results from the 2022 Census were also reviewed. The data collected included information on population, structure, age profile and household size, number of persons at work and the unemployment profile.

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

- Environmental Protection Agency (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.
- Department of Housing, Planning and Local Government (2018). *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*.
- European Commission (2017). *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*.

The effects section of this chapter follows the terminology (where applicable) used in the 2022 EPA Guidelines as set out in Chapter 1 of this EIAR.

## 17.3 Baseline Conditions

The following provides a description of the receiving environment, with a focus on demography, land use and local amenity.

The subject site lies within the Cork City Council administrative area. The Government's 2018 National Planning Framework (NPF) identifies Cork as being located within the Southern Region and sets out a target population growth for the city. The NPF specifies an objective to regenerate and rejuvenate Cork City with increased residential population and enhanced amenity and design quality.

### 17.3.1 Housing

The latest Government housing plan, *Housing for All*, was published in September 2021 and addresses the time period to 2030. The Plan sets out a strategy to achieve a steady supply of housing in the right locations. It estimates that the country will need an average of 33,000 new homes each year between 2021 and 2030.

According to the CSO New Dwelling Completions Report (April 2022), 5,669 new dwellings have been completed in the first quarter of 2022. Extrapolating this trend to the year, would give a total of 22,676 housing units, well below the Government's annual target of 33,000.

According to the Department of Housing, Local Government and Heritage's Homelessness Report (May 2022), there were 547 homeless adults recorded in the South-West Region during the week of 23-29 May

2022. A total of 459 of these people were recorded to be homeless in Cork, an increase of 12% on the same period in 2021.

The NPF requires delivery of a baseline of 25,000 homes annually to 2020, followed by a likely level of 30-35,000 annually up to 2027 (as referenced above, this Government target has since been updated wit the publication of the *Housing for All* plan in 2021). Within this output, 112,000 households are expected to have their housing needs met in a social housing home over the next decade. To achieve the objective of compact growth, the NPF directs that 40% of future housing delivery is to be delivered within and close to the existing footprint of built-up areas.

### 17.3.2 Land Use

The subject site is located within the Kilbarry area of the city, and is, along with a series of other significant sites adjoining, zoned for residential development. Therefore, the principle of residential development on the zoned Z01 lands is acceptable, subject to the consideration and acceptability of the site-specific matters. Figure 17.1 provides an overview of the available bus infrastructure within a 1km walking catchment of the site.

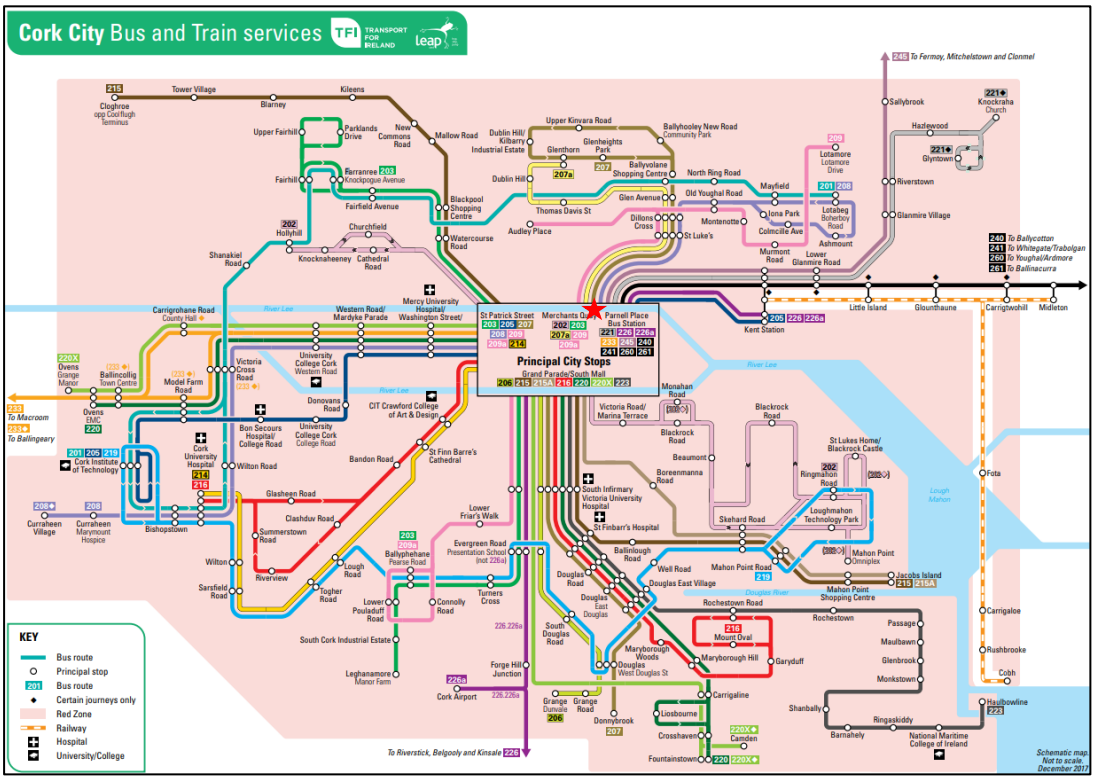


**Figure 17.1: Cork City Bus and Train Transport Accessibility (Source: TFI)**

### 17.3.3 Demographic Profile

The profile of the area has been reviewed against the following matters:

- Demographics;
- Small Area Population Statistics; and
- Existing Facilities:
    - Community Service Facilities

- Education & Childcare
- Health and Wellbeing
- Public Open Space and Recreation
- Cultural

**Demographics**

Population figures from the Central Statistics Office (CSO) Electoral Divisions data was used to create a profile of the area surrounding the site. The catchment area, defined as with 2km of the site, incorporates 11no. No. Electoral Division Areas (EDs).


**Figure 17.2: Site Catchment**

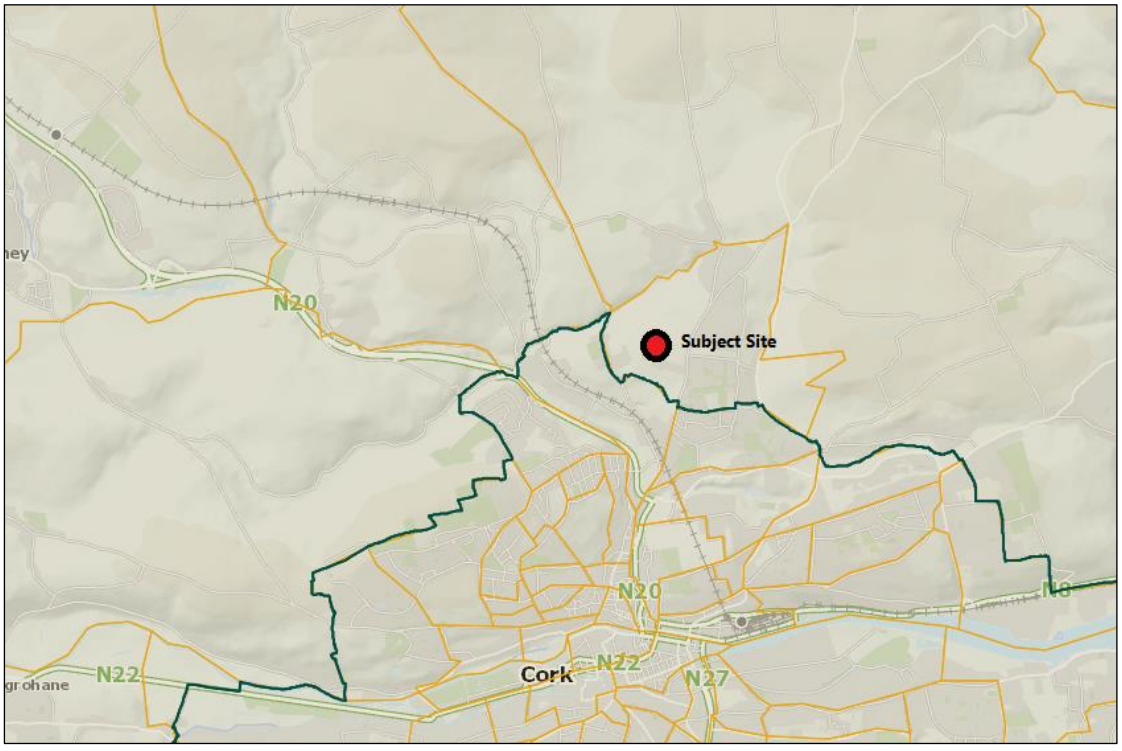


**Figure 17.3: Site with Highlighted Electoral Divisions. (Source: CSO)**

The demographic profile of the wider Kilbarry area is as outlined in Table 17.1 below.

| ED | Total Population 2011 | Total Population 2016 | Change | 0-4 age bracket 2011 | 0-4 age bracket 2016 | Total Change |
|---|---|---|---|---|---|---|
| **St Mary's** | 5158 | 5538 | +380 (7.4) | 466 | 381 | -85 (-18.2%) |
| **Rathcooney** | 8181 | 8574 | +394 (+8.4%) | 713 | 720 | +7 (+1%) |
| **Whitechurch** | 2813 | 3000 | +187 (+6.6%) | 270 | 248 | -22(-8%) |
| **Commons** | 885 | 963 | +78 (+8.8%) | 71 | 81 | +11 (+16%) |
| **Fairhill C** | 3715 | 3610 | -105 (-2.8%) | 222 | 186 | -36 (-16%) |
| **Fairhill B** | 777 | 746 | -31 (-4%) | 118 | 136 | +18 (+15%) |
| **Farranferris B** | 887 | 928 | +41(4.6%) | 173 | 204 | +31 (+18%) |
| **Farranferris A** | 1812 | 2044 | +232 (+12.8%) | 429 | 536 | +107 (+25%) |
| **Blackpool A** | 663 | 690 | +27 (+4.1%) | 39 | 39 | 0 |
| **Glen A** | 2354 | 2466 | +112 (+4.8%) | 143 | 134 | -9 (-6.3%) |
| **Glen B** | 3775 | 3699 | -76 (-2%) | 196 | 212 | +16 (+7.6%) |
| **Total** | **28,488** | **32,258** | **+3770 (+13.2%)** | **2840** | **2877** | **+37 (+1.3%)** |

**Table 17.1: Electoral Division Areas and Population Change 2011-2016**

The population of this catchment increased from 28,488 people in 2011 to 32,258 no. people in 2016, representing a significant increase of over 13% over the 5-year period.

The overall population trend is expected to continue with increased population growth and urbanisation, putting pressure on the need for more homes.

In contrast to the population growth of the catchment area over the inter-censal period, the population growth of Cork City and suburbs is also examined, as the subject site is within the defined settlement area of Cork City, as per the 2016 Census.

It is noted that the population of Cork City and suburbs increased from 198,582 no. people in 2011 to 208,669 people in 2016. This represents an increase of 10,087 people, or a 5.1% increase in population

over the same period. This is markedly lower than the increase of 13.2% in the defined catchment area of the site of the proposed development.

Table 17.2 below presents the age profile of the population of the defined catchment area according to the 2016 Census.

A review of the age profile of the area reveals that the area has an evenly distributed ratio of population, with 23% of the population being aged 55 years or older, while 27.3% of the population are under the age of 18. 20.9% of the population are between the ages of 19 and 35, while 28.8% are between the ages 35-54.

| Age Bracket | Population 2016 | % of Population |
|---|---|---|
| 0-4 | 2230 | 6.9% |
| 5-12 | 3874 | 12% |
| 13-18 | 2716 | 8.4% |
| 19-24 | 2354 | 7.3% |
| 25-34 | 4377 | 13.6% |
| 35-44 | 4924 | 15.3% |
| 45-54 | 4357 | 13.5% |
| 55-64 | 3374 | 10.5% |
| 65+ | 4052 | 12.5% |

**Table 17.2: Age profile of the defined catchment area as per the 2016 Census.**

**Existing Facilities**

This chapter assesses the existing community and social infrastructure within the defined catchment area of the site of the proposed development (as outlined and discussed in Section 17.3.3.1 above) under the following headings:

| | |
|---|---|
| 1. Education/Training | 2. Social/Community Services |
| 3. Childcare | 4. Arts and Culture |
| 5. Health | 6. Faith |
| 7. Sports/Recreation and Open Space | 8. Other Features |

*Education/Training*

According to the 2016 Census, there were approximately 3,114 no. children of primary school-going age and approximately 2,716 no. children of post-primary school-going age living in the defined catchment area of the proposed development in 2016. There are 13 no. existing primary schools and 6 no. existing post-primary schools within the catchment area (see Tables 17.3 and 17.4 below). In addition, there are several other primary and post-primary schools immediately adjacent and/or in the vicinity of the catchment area.

| Existing Primary Schools | |
|---|---|
| **Name and Location** | **Enrolled** |
| 1. Scoil Oilibhéir | 542 |
| 2. St Brendan's School/ Glen Girls NS | 103 |
| 3. S N Padraig Naofa C | 168 |
| 4. S N Padraig Naofa | 98 |
| 5. St Patricks Boys Primary School | 194 |
| 6. St John the Apostle/ Scoil Eoin Aspal (Now Scoil Mhuire agus Eoin- Naomh Eoin Easpal and Scoil Mhuire Banrion amalgamated) | 270 |
| 7. St Marks Boys NS | 100 |
| 8. Gaelscoil an Ghoirt Alainn | 377 |
| 9. Scoil Iosgáin | 305 |
| 10. North Presentation Primary | 233 |
| 11. Scoil Aiseiri Chríost | 292 |
| 12. North Monastery Primary/ Scoil Mhuire Fatima | 126 |
| 13. St Vincent's Convent | 247 |

**Table 17.3: Existing primary schools located within the defined catchment area of the proposed development.**

| Existing Post-Primary Schools | |
|---|---|
| **Name and Location** | **Enrolled** |
| 1. St Aidans | 374 |
| 2. St. Patricks College | 241 |
| 3. Mayfield Community College | 293 |
| 4. St. Vincents | 216 |
| 5. The North Monastery | 304 |

**Table 17.4: Existing post-primary schools located within the defined catchment area of the proposed development.**

The provision of primary and post-primary school facilities in Ireland is determined on an area specific basis by the Department of Education, having regard to available school capacity, demographic projections, analysis of child benefit records, and local GIS travel pattern modelling.

According to the Cork City Development Plan 2022-2028, the Department of Education has prepared preliminary projections of requirements for school places in Cork City up to 2031, and the projections suggest a potential need of up to 19 no. new or expanded primary schools and up to 7 no. new or expanded post-primary schools as per Table 5 below. This preliminary assessment suggests that between 4no. and 6no. new or expanded primary schools and 3 no. new or expanded post-primary schools are envisaged as being required in the immediate vicinity of the catchment area of the proposed development over the next decade.

| Department of Education Preliminary Assessment of Additional Education Capacity | | |
|---|---|---|
| **School Planning Area** | **Number of new or expanded Primary Schools (baseline figure)** | **Number of new or expanded Secondary Schools (baseline figure)** |
| Ballintemple | 5-7 | 2 |
| Montenotte | 2-3 | 1 |
| Glasheen | 1-3 | |
| Gurranabraher | 1-2 | 1 |
| Ballincollig | 2 | 1 |
| Blarney | 1-2 | 1 |
| Glanmire | 1 | 1 |

**Table 17.5: Department of Education Preliminary Assessment of Additional Education Capacity. (Source: Cork City Development Plan 2022-2028).**

In their submission to the Draft Cork City Development Plan 2022-2028 and in relation to the northeast suburbs of Cork City, the Department of Education state that they will examine the forthcoming Framework Plan for the development of the Blackpool/Kilbarry area (as envisaged under the Draft Development Plan) when produced in order to assess the implications for educational requirements in the area.

The Department's submission also notes that new schools will also be required in the neighbouring area of Ballyvolane, to cater for the anticipated and targeted population growth there.

While there are no Third Level Facilities in the immediate vicinity of the site, the site is well served by public transport and, as a result, there are 10 no. further and third level education facilities accessible from the site, as outlined in Table 17.6 below. In addition, there are several other further and third level education facilities, including University College Cork (UCC) and Munster Technological University (MTU) which are well served by transport links from the proposed site.

| Existing Third-Level Education |
|---|
| **Name and Location** |
| 1. Northside Community Enterprises (NCE)Education & Training Campus, Redemption Rd, Farranferris, Co.Cork, Ireland |
| 2. Griffith College Cork Wellington Rd, Cork |
| 3. CEC - Cork English College Saint Patricks Bridge, Cork |
| 4. CityNorth College of Further Education Harbour View Rd, Gurranabraher, Hollyhill, Co. Cok |
| 5. Cork Academy of Music, Technical Building, North Monastery Campus, North Monastery Road, Cork |
| 6. Cork College of Commerce, Morrison's Quay. |
| 7. The Cork College of Beauty Therapy, 85 South Main Street. |
| 8. Joan Cashman Colour & Image Academy, 19 Academy Street. |
| 9. IPICS Education, Unit 1dNorth Valley Business Park, Old Mallow Road, Cork |
| 10. Irish College of Osteopathic Medicine, Unit 42A/B North Point Business Park, New Mallow Road, Cork |

**Table 17.6: Existing third-level education facilities located within the defined catchment area of the proposed development. (Sources: Websites of the various institutions).**

It is evident that ample primary, post-primary and further and third level educational facilities and services exist and are planned that can cater for the population of the catchment area of the proposed development now and into the future.

*Childcare*

With regards Cork City and its suburbs, it is noted that between 2011 and 2016, the number of children in the 0-4 age bracket decreased from 12,762 in 2011 to 12,652 in 2016, representing a decrease of 110 no. children over the same period. In contrast to the overall population, which increased by over 5% during the inter-censal period, the number of children in the 0-4 age bracket has actually reduced. This indicates that the number of pre-school (i.e. 0-4 age bracket) children is declining within the settlement as a whole.

Meanwhile, the population of the catchment area of the proposed development increased from 28,488 people in 2011 to 32,258 no. people in 2016, representing a significant increase of over 13% over the 5-year inter-censal period. Of note is that over the same period, the number of children in the 0-4 age bracket only increased by 37 no. people, representing an increase of just 1.3% over the intervening period. Data from TUSLA's website, combined with responses from 7 no. of the 8 no. the childcare providers, was used to ascertain the number of existing registered childcare facilities in the defined catchment area, their maximum capacity and the current number of children availing of their services.

| Childcare Facility | Capacity (No. of children service can accommodate) | Available Spaces on Inspection Day | % Available Spaces |
|---|---|---|---|
| **Tir na Nog Montessori School Delaneys** | **22** | **4** | **18%** |
| **First Friends Rathpeacon** | **44** | **12** | **27%** |
| **Mayfield Community Playschool** | **24** | **3** | **12.5%** |
| **Glenfields Community Childcare Limited** | **38** | **15** | **39.5%** |
| **Tir na nOg Glen Community Resource Centre** | **13** | **0** | **0%** |
| **Little Hands Childcare** | **120** | **5** | **4.1%** |
| **Naíonra na mBachlóg/Little Buds Pre-School** | **40** | **17** | **42.5%** |
| **Glentrasna Community Pre-School** | **22** | **Not available** | **Not available** |
| **Total** | **323** | **56** | **17%** |

**Table 17.7: Existing TUSLA Registered Early Years Childcare Facilities as of April 2022. (Source: TUSLA, 2022; the various childcare providers).**

It is evident, from Table 17.7 above, that while there is some availability of childcare places within the existing local childcare facilities, this availability is somewhat limited in its capacity to fully cater for the increased demand for childcare places that the proposed development may result in.

*Health*

Desktop research during October 2021 and June 2022 was employed to ascertain the number of health facilities and services located within the catchment area of the proposed development. The results of this research are presented in Table 17.8 below. A total of 73 no. health facilities were identified in the area comprising: 1no. hospitals; 17no. GP practices; 24 no. pharmacies; 12 no. dental surgeries; 11no. physiotherapists; and 8no. opticians.

There are no national, regional or local standards for health provision in Ireland relating to the provision of primary care centres or the number of doctors in an area. However, the HSE has confirmed that a typical primary care centre can serve a population of between 10,000-20,000 people, subject to appropriate resourcing.

| Description of Health Service/Facility | | Name and Location |
|---|---|---|
| 1no. Hospitals | 1. | St. Marys Health Campus, Garranabraher |
| 17no. GP Surgeries | 1. | Wherland's Lane Medical Centre Blackpool Bridge Blackpool Cork |
| | 2. | Blackpool Bridge Surgery, 83 Thomas Davis Street, Blackpool, Cork |
| | 3. | Blackpool Medical Centre, 90 Great William O'Brien Street, Blackpool Cork |
| | 4. | Broad Lane Family Practice, 72 Great William O'brien Street, Blackpool, Cork |
| | 5. | Dr. Margaret Fitzsimons, 104 Gerald Griffin Street, Blackpool, Cork |
| | 6. | Meadow Park Surgery, 1 Meadow Park Drive, Ballyvolane, Cork |
| | 7. | Wellness Centre, Apple, Hollyhill Industrial Estate, Hollyhill, Cork |
| | 8. | Mayfield Family Practice, Mayfield Shopping Centre, Silversprings Road, Mayfield, Cork |
| | 9. | Hollyhill Medical Centre, Saint Mary's Health Campus, Baker's Road, Gurranebraher |
| | 10. | Dr. Jeremy Gibson, Saint Mary's Health Campus, Baker's Road, Gurranebraher, Cork |
| | 11. | Gurranabraher Medical Centre, Saint Mary's Primary Care Centre, Baker's Road, Gurranebraher, Cork |
| | 12. | Medi-group, Cathedral Road, Gurranebraher, Cork |
| | 13. | Military Hill Surgery, Military Road, Saint Lukes, Cork |
| | 14. | Parklands Surgery, 1 Park Grove, Parklands, Cork |
| | 15. | Shandon Medical Centre, 51 Shandon Street, Cork |
| | 16. | Cork City Medical Centre, 91 St Patrick's Street. |
| | 17. | Patrick Street Medical Centre, 9 St. Patrick's Street. |

| | | |
|---|---|---|
| 12no. Dental Surgeries | 1. | Onslow gardens Dental Practice, Kilnaught House, Glenwood Drive, Onslow Gardens, Cork |
| | 2. | The Atrium Clinic, Atrium Business Centre, Level 1, Blackpool Retail Park, Cork, |
| | 3. | Meadow Park Surgery, 1 Meadow Park Drive, Ballyvolane, Cork |
| | 4. | Cork City Dental, 18 Commons Road, Cork |
| | 5. | MD Clinic, The Plaza, City Square, Watercourse Road, Cork |
| | 6. | O'Hara's Dental Practice, 4 Shandon Street, Cork, |
| | 7. | Blarney Street Dental Surgery, 385 Blarney Street, Cork |
| | 8. | Martin K. Holohan, Hillview Lodge, 93 Ballyhooly Road, Cork, |
| | 9. | Cork Dental Care Kilbrin House, 6 Mount Verdon Terrace, Wellington Road, Cork, |
| | 10. | Oliver Collins, 6 Camden Place, Cork, |
| | 11. | Monahan Dental Practice, 12 Popes Quay, Cork, |
| | 12. | Frank Whelton Dental Surgery, 119 Saint Patrick's Street, Cork |
| 24no. Pharmacies | 1. | Pharmacy First Plus Northside, Kilnaught House, Glenwood Drive, Onslow Gardens, Cork |
| | 2. | Boots, Unit C, Blackpool Retail Park, Cork City, Co. Cork |
| | 3. | Popham's Road Pharmacy, 12 Popham's Road, Farranree, Cork, |
| | 4. | McCauley Health & Beauty Pharmacy, Blackpool Shopping Centre, Blackpool, Cork, |
| | 5. | Horgans Pharmacy, Atrium Business Centre, Level 1, Blackpool Retail Park, Cork |
| | 6. | Blackpool Bridge Pharmacy Ltd, Blackpool Bridge, Blackpool, Cork, |
| | 7. | Glenheights Pharmacy, Unit 4 Chapelgate Shopping Centre, Glenheights Road, Ballyvolane, Cork, |
| | 8. | Blackpool Late Night Pharmacy, The Plaza, City Square, Watercourse Road, Cork, |
| | 9. | Walsh's Pharmacy, 123 Shandon Street, Cork |
| | 10. | Deasy's Pharmacy, 98 Shandon Street, Cork, |
| | 11. | Irwin's Pharmacy, 77 Shandon Street, Cork, |
| | 12. | Hickey's Pharmacy, 11a Gurranebraher Road, Gurranebraher, Cork |
| | 13. | Walsh's Pharmacy, 256 Old Youghal Road, Cork, |
| | 14. | St. Luke's Pharmacy, 38 Wellington Road, St. Luke's Cross, Cork City, |
| | 15. | Falveys Pharmacy, 17 Bridge Street, Cork, |
| | 16. | Minihan's Pharmacy, 108 Oliver Plunkett Street. |
| | 17. | Phelan's Pharmacy, 9 St. Patrick's Street. |
| | 18. | Boot's Pharmacy, 1 Half Moon Street. |
| | 19. | Boot's Pharmacy, 71/72 St. Patrick's Street. |
| | 20. | Murphy's Pharmacy, 48 North Main Street. |
| | 21. | Dalton's Pharmacy, Unit 11/12, North Main Street Shopping Centre, North Main Street. |
| | 22. | North Gate Pharmacy, 12 North Main Street. |

| | | |
|---|---|---|
| | 23. | Boot's Pharmacy, Unit F4-F7, Merchant's Quay Shopping Centre, Merchant's Quay. |
| | 24. | Santry's Pharmacy, 25a Washington Street West. |
| 11no. Physiotherapists | 1. | Next Level Physiotherapy Cork, Unit 4/5 The Plaza, Within MD Clinic City Square, Watercourse Rd, Blackpool |
| | 2. | Blackpool Physiotherapy & Sports Injury Clinic, 5A, Kilnap Business Park, Old Whitechurch Rd |
| | 3. | Paediatric Physiotherapist Alan Lyons MISCP, Blackpool Physiotherapy Clinic, Unit 5A Kilnap Business Park,, Old Mallow Rd,, Cork |
| | 4. | Fairfield Sports Injuries Clinic, 1, Silverdale, Fairfield Rd, Farranree, Cork City, Co. Cork |
| | 5. | Colette Trout Physical Therapy and Craniosacral Clinic, Unit 2, First Floor,, Fox and Hounds Development, Ballyvolane |
| | 6. | Trigger Point Therapy, Unit 31 Northpoint Business Park, Blackpool, Cork |
| | 7. | PhysioActive, Dillon's Cross Medical Centre, Old Youghal Rd, Dillons Cross, Cork, |
| | 8. | Blackpool Physiotherapy Clinic, Unit 5A, Kilnap Business Park, Old Whitechurch Rd, Cork |
| | 9. | Sports injury and recovery centre Cork unit 6, Fox & Hounds Retail Pk, Ballyvolane, Cork |
| | 10. | The Stress Clinic, John Street, Cork City, Co, Cork |
| | 11. | Oakfield Neuromuscular Therapy, Old Youghal Rd, Mayfield, Cork |
| 8no. Opticians | 1. | O'Connor Poole Opticians, Unit 5 Moremiles Retail Centre, Redforge Rd, Blackpool Shopping Centre, Blackpool |
| | 2. | Leonie Lyons Optician, 7 Bridge St, Victorian Quarter, Cork |
| | 3. | OpticalRooms – Cork, Cork Wellness Centre, Hollyhill Ln, Hollyhill Industrial Estate, Cork |
| | 4. | Crowley's Opticians, 26 Grand Parade. |
| | 5. | John Daly Opticians, 77 Oliver Plunkett Street. |
| | 6. | Vision Express Opticians, 38 St. Patrick's Street. |
| | 7. | Specsavers, 2 Opera Lane. |
| | 8. | Egan's Opticians, 5-6 Lavitt's Quay. |

**Table 17.8: List of health services and facilities in the defined catchment area of the proposed development.**

*Sports/ Recreation and Open Space*

Sports and recreation infrastructure refers to parks and playgrounds, dedicated public open space and amenity areas, sports centres, and formal club facilities. Desktop research during October 2021 and June 2022 was employed to ascertain the number and nature of sports/ recreation facilities and open spaces located within the catchment area of the proposed development. The results of this research are presented in Tables 17.9 and 17.10 below.

There are several clubs and open spaces allocated to provide for sports and recreational related activities, comprising as follows: 1no. regional park; 4no. local parks; 1no. sports stadium; 9no. outdoor playing pitches; and 4no. playgrounds. There are also 14no. sports clubs in the area.

In addition to the parks outlined in Table 17.10 below, there are multiple other urban squares, spaces, and pocket parks distributed throughout the catchment area. There is also a proposal in this development to establish a park in the northern part of the site.

| Description | Name and Location |
|---|---|
| 1no. Sports Stadiums | 1. Neptune Stadium, 95 Gerald Griffin St, Blackpool, Cork (Indoor Sports) |
| 9no. Playing Pitches | 1. Delaneys GAA Pitch, Kilbarry, Cork<br>2. Blackstoner Rovers FC, Anton, 16 Parklands Dr, Commons Road, Parklands, Cork<br>3. Temple United, Exchange Business Park Churchfield Industrial Estate, Temple Park, Churchfield, Cork<br>4. Glen Rovers Hurling Club, Ballincollie Rd, Ballyvolane, Cork<br>5. Castleview AFC, John F, Connolly Rd, Co. Cork<br>6. St. Vincent's GAA Club, Dunmore Gardens, Knocknaheeney, Cork<br>7. Na Piarsaigh (Cork) GAA Club, Fair Hill, The Commons, Cork<br>8. Leeds AFC, Meelick Park, Cork<br>9. CBC's Grounds at Landsdowne, Old Youghal Road, The Glen, Cork<br>10. The Glen Resource & Sport Centre Glen Avenue, The Glen, Cork |
| 14no. Sports Clubs | 1. Delaneys GAA Pitch, Kilbarry, Cork<br>2. Blackstoner Rovers FC, Anton, 16 Parklands Dr, Commons Road, Parklands, Cork<br>3. Temple United, Exchange Business Park Churchfield Industrial Estate, Temple Park, Churchfield, Cork<br>4. Glen Rovers Hurling Club, Ballincollie Rd, Ballyvolane, Cork<br>5. Castleview AFC, John F, Connolly Rd, Co. Cork<br>6. St. Vincent's GAA Club, Dunmore Gardens, Knocknaheeney, Cork<br>7. Na Piarsaigh (Cork) GAA Club, Fair Hill, The Commons, Cork<br>8. Leeds AFC, Meelick Park, Cork<br>9. Brunell Basketball Club, 5 Close's Rd, Cork<br>10. Northside Boxing Club, Cork<br>11. Brian Dillon's Boxing Club, 21 Stream Hill, Dillons Cross, Cork,<br>12. Glen Boxing Club, 10 Glen Ave, Blackpool, Cork<br>13. Farranree Taekwon-Do Club, Scoil Iosagain BNS, Knockpogue Ave, Farranree, Cork<br>14. MMA CORK, Unit 4, New Sunbeam Industrial Estate, Blackpool, Co. Cork |
| 4no. Playgrounds | 1. Toddlers' Playground, Assumption Rd, Blackpool, Cork<br>2. Kempton park playground, Cork<br>3. Glentrasna park, The Glen, Cork<br>4. Gerry O'Sullivan Park, St Colmcille's Rd, Cork |

**Table 17.9: Existing recreational and sports facilities and clubs in the defined catchment area of the proposed development.**

| Description | Location |
|---|---|
| 1no. Regional Park | 1. The Glen River Park |
| 4no. Local Parks | 1. Tank Field<br>2. Spring Lane Park<br>3. Blackpool Park<br>4. Bride Valley Park |

**Table 17.10: Existing open spaces in the defined catchment area of the proposed development.**

It is evident that the area is well-served by open spaces and sports facilities, as indicated above. These facilities will cater for all age cohorts of the proposed development.

However, it is noted that there is no parkland adjacent to the site of the proposed development.

*Social/ Community Facilities*

Social and community facilities are broad categories and can include general civic services as well as services targeted to specific sectors of the community. Desktop research during October 2021 and June 2022 were employed to ascertain the number and nature of social/ community services located within the catchment area. The result of this research is presented in Table 17.11 below.

There are 33 no. social and community facilities and services within the area as follows: 7no. Civic Facilities and Services; 16no. Social/Community Organisations; 5no. Adult Education/Training and Employment Services, and; 5no. Youth Services.

| Description | Name and Location |
|---|---|
| 7no. Civic Facilities and Services | 1. Blackpool Library, Redforge Rd, Blackpool Shopping Center, Blackpool, Cork<br>2. Hollyhill Libray Harbour View Rd, Gurranabraher, Cork<br>3. Cork City Hall, Anglesea Street.<br>4. City Library, Grand Parade.<br>5. Citizens Information Centre (Mayfield) Old Youghal Road, Roseville House (lower Level), Mayfield, Co. Cork<br>6. Citizen's Information Centre, 13-15 Cornmarket Street.<br>7. Cork City MABS, 101 North Main Street. |
| 16no. Social/ Community Organisations | 1. My Canine Companion autism service dogs Sunbeam Industrial Estate, Unit 8, New, Commons Rd, Cork,<br>2. Blackpool Community Centre, 90 Great Wm O'Brien St, Cork<br>3. NASC The Migrant and Refugee Rights Centre, 34 Paul Street.<br>4. Street Angels 107A Shandon St, Gurranabraher, Cork,<br>5. Cork Simon Community, Mill House, Anderson's Quay.<br>6. Feed Cork Food Bank, Cork Church, Lower Oliver Plunkett Street.<br>7. Shine Mental Health Family Support, 14a Washington Street.<br>8. Cork Penny Dinners, 4 Little Hanover Street.<br>9. Society of St Vincent de Paul - South West Region, Ozanam House, 2 Tuckey Street. |

| | |
|---|---|
| | 10. Respond Housing, St. Francis Gardens, Thomas Davis St., Blackpool, Cork<br>11. Edel House, Grattan Street.<br>12. Cuanlee Refuge for Abused Women & Children, Kyrl's Quay.<br>13. The Samaritans, Coach Street.<br>14. Focus Ireland, South Mall.<br>15. Meitheal Mara Teoranta, Crosses Green.<br>16. Threshold, South Mall. |
| 5no. Adult Education/Training and Employment Services | 1. Cork City Partnership Ltd., Heron House, Blackpool Retail Park, Cork<br>2. Local Enterprise Office, Cork City Hall, Anglesea Street.<br>3. Cork City Adult Guidance Service, 22 South Mall.<br>4. Turas Nua, 12 South Mall.<br>5. Intreo, Abbeycourt House, George's Quay. |
| 5no. Youth Services | 1. FAYRE GYDP Cushing House, Popham's Rd, Farranree, Cork<br>2. Foróige Office Cork City Square, 44 Watercourse Rd, Blackpool, Cork<br>3. Stepping Ahead Clinic, Unit 6A, Kilnap Business Park, Old Mallow rd, Cork.<br>4. YMCA Cork, Marlboro Street.<br>5. Jigsaw, Crosses Green Wandesford Quay. |

**Table 17.11: Existing social/ community facilities and services located within the defined catchment area of the proposed development.**

There are no national, regional, or local standards regarding the provision of social and community facilities and services. A simplistic standardisation which has been employed elsewhere in neighbourhood planning is: 0.3 community facilities per 1000 head of population[1].

However, this approach is somewhat crude, being based on the number of buildings/ facilities provided and does not account for the size or quality of individual facilities. Consequently, the use of this standard is applied with caution and as a benchmark only. It can be assumed, based on the information presented in Table 17.11 above, that the area is well served in terms of social and community facilities.

*Arts and Culture*

Desktop research during October 2021 and June 2022 was employed to ascertain the number and nature of arts and culture facilities located within the catchment area of the proposed development. The result of this research is presented in Table 17.12 below. There are 18no. arts and culture facilities in the area.

Cork City has a long-established reputation as being a thriving centre for the arts and culture, with multiple festivals and initiatives at every scale in the city. With 18no. arts and culture facilities readily identified within the defined catchment area of the proposed development alone, it is considered that the area is well-served in this regard.

[1] See: Barton, H., Grant, M., and Guise, R. (2021). *Shaping Neighbourhoods: For Local Health & Global Sustainability*, *3rd edition*. London:

| Description | Name and Location |
|---|---|
| 14no. General Art and Culture Facilities | 1. The Reel Picture Blackpool Shopping Center, Blackpool Retail Park, Cork,<br>2. Cork Community Art Link 71 Watercourse Rd, Blackpool, Cork,<br>3. Graffiti Theatre Company Limited, Assumption Rd, Blackpool, Cork,<br>4. Cork Arts Theatre Carroll's Quay, Shandon, Cork<br>5. The Everyman 15 MacCurtain Street, Victorian Quarter, Cork,<br>6. Firkin Crane John Redmond St, Shandon, Cork<br>7. Triskel Arts Centre, Tobin St.<br>8. The Cellar Theatre, Mardyke Entertainment Complex, Sheares Street.<br>9. Cork Opera House, Emmett Place.<br>10. Half Moon Theatre, Half Moon Street.<br>11. The Gate Cinema, North Main Street.<br>12. Crawford Art Gallery, Emmett Place.<br>13. St. Peter's Cork, North Main Street. |
| 4no. Music Facilities | 1. Cork Academy of Music Technical Building, North Monastery Campus, North Monastery Road, Cork<br>2. The Kabin Studio Harbour View Rd, Holyhill, Cork<br>3. African Drumming Ireland Workshops for Schools Dervish Holistic Centre, 50 Cornmarket St, Cork,<br>4. The Guesthouse Project 10 Chapel St, Shandon, Cork |

**Table 17.12: Existing arts and culture facilities located within the defined catchment area of the proposed development.**

*Faith*

There are 21no. centres of religious worship located within the catchment area. They are listed below in Table 17.13. In addition, there are 2no. burial grounds in the catchment area and these are listed in Table 17.14 below.

There are no known national or other benchmarking standards for the provision of religious faith and worship social infrastructure. According to Census 2016, 84.6% of the Irish population are Christian, 1.3% are Muslim, and 10% of people living in Ireland do not identify as having any religious faith.

The catchment area appears to be well-served by centres of worship, predominantly in respect of the Roman Catholic faith, but also in respect of the Church of Ireland, various other Christian faiths, and the Muslim faith.

| Details of Centres of Worship |
|---|
| 1. RCCG Faith Arena 3 Commons Rd, Cork |
| 2. Church of the Annunciation,Great William O'Brien Street, Blackpool, Cork |
| 3. St Oliver's Catholic Church, Ballyvolane Dublin Hill, Cork |
| 4. Legion Of Mary Father O'Leary Memorial Hall, 3 Shandon St, Shandon, Cork, T23 XF86 |
| 5. Muslim Foundation Cork Nicholas Well Lane, Gurranabraher, Cork |

| |
|---|
| 6. Catholic Grotto To Our Lady of Lourdes & Christ the Saviour Maria Ville, 42 McSwiney's Villas, Gurranabraher, Cork, T23 PPW3 |
| 7. Cork Dawah Centre 73 Shandon St, Sunday's Well, Cork |
| 8. St Mary's Dominican Church, Shandon Popes Quay, Shandon, Cork |
| 9. St Mary's Dominican Priory 1 Mulgrave Rd, Shandon, Cork, T23 C634 |
| 10. Shandon Bells & Tower St Anne's Church Church St, Shandon, Cork |
| 11. St Mary's & St Anne's Presbytery & Parish Office The Presbytery, Cathedral St, Roman St, Shandon, Cork |
| 12. Cathedral of St Mary & St Anne, Shandon Cathedral St, Shandon, Cork |
| 13. Earth Spiritualist Foundation 6 Sidney Pl, Victorian Quarter, Cork |
| 14. CITY MASJID Coburg Lane, 6A, Coburg St, Cork, T23 Y6C2 |
| 15. Cork Baptist Church MacCurtain Street, Victorian Quarter, Cork |
| 16. Assemblies Of God 53 MacCurtain Street, Victorian Quarter, Cork, T23 VH56 |
| 17. Holy Family Roman Catholic Church Military Hill, St Luke's, Cork |
| 18. St. Brendan's Roman Catholic Church, The Glen Ave, The Glen, Cork |
| 19. Catholic Grotto To Our Lady of Fatima & The Three Shepherd Children Blackpool, Cork |
| 20. Church of the Resurrection, Farranree, Cork |
| 21. Diocese of Cork and Ross Redemption Rd, Cork, T23 PXD0 |

**Table 17.13: Existing centres of religious worship located within the defined catchment area of the proposed development.**

| Details of Burial Grounds |
|---|
| 1. St Catherine's Cemetery, Kilcully, Cork |
| 2. Rathcooney Grave Yard Rathcooney, Co. Cork |

**Table 17.14: Existing burial grounds in the defined catchment area of the proposed development.**

*Other Social and Community Infrastructure*

As Cork City Centre is within the vicinity of the site of the proposed development, the City Centre Retail Area and City Centre Commercial Core are both located within the vicinity of the proposed development, where all major and minor retail, financial, legal, hospitality and other services, supports and organisations are available. Indeed, in addition to serving the population of Cork City, people travel from across the county of Cork as well as from other parts of Munster to avail of the high quality service provision in Cork City Centre.

Furthermore, there are 2no. District Centres, 2no. Neighbourhood Centres and 1no. Local Centres located within the catchment area.

Para ZO 7.1 of the Cork City Development Plan 2022-2028 advises the following in relation to the function of District Centres:

> *District Centres act as a focus for a range of services, and together with the City Centre and Urban Town Centres they form part of an integrated strategy for mixed use compact growth in key locations of Cork City.*

Para ZO 8.1 of the Cork City Development Plan 2022-2028 advises the following in relation to the role of Neighbourhood and Local Centres:

> *Neighbourhood and Local Centres contribute to sustaining liveable communities and neighbourhoods by fulfilling a local convenience retail, employment and service function, providing a mix of uses and range of services, at an appropriate local scale, to the local population often within a 5- or 10- minute walking distance.*

Specific zoning objectives apply to the City Centre Retail Area, City Centre Commercial Core Area, and all District, Neighbourhood Centres and Local Centres in order to protect and enhance their functional and amenity value.

| Description | Name and Location |
|---|---|
| Cork City Retail Area | City Centre |
| Cork City Commercial Core Area | City Centre |
| 2no. District Centre | 1. Blackpool Shopping Centre<br>2. Ballyvolane Shopping Centre |
| 2no. Neighbourhood Centres | 1. Along the N20 Towards Blackpool Shopping Centre<br>2. Located North on Mount Agnes Road |
| 1no. Local Centres | 1. Old Youghal Road |

**Table 17.15: Other social and community infrastructure in the defined catchment area of the proposed development.**

The nearest zoned District Centre is located approximately 600m south of the subject site, the nearest Neighbourhood centre is located 1.7km to the south, while the nearest zoned Local Centre is located approximately 2.4km south-east of the subject site.

## 17.4 Significant Likely Effects

This section of the assessment describes those effects that are likely to arise in the absence of mitigation. Section 17.5 of this chapter sets out the mitigation measures required to alleviate such effects and the assessment of impacts post mitigation is presented in the Residual Impact Section.

Potential effects are considered under the following headings:

- Land use
- Human Health Impacts
- Population & Economic Activity Impacts
- Local Amenity Impacts

In each case construction and operational effects are considered. It should be noted that the construction phase effects include the proposed demolition works.

### 17.4.1 Do Nothing Scenario

If the proposed development is not realised, it is anticipated that the subject site would remain vacant and underutilised in the short to medium term. The application area is a significant landbank at a pivotal location and, left unoccupied for any significant period, it would likely go into decline. In terms of this subject matter, Population and Human Health, vacant sites can have adverse effects on the character of an area resulting in urban blight and decay. Anti-social behaviour is often associated with vacant sites and this would have a negative effect on the local population.

### 17.4.2 Construction Phase

*Land Use*

The proposed development complies with the statutory land use zoning. There will be no severance of land, loss of rights of way or amenities as a result of the proposed development. Development of the subject site is aligned with the objective to achieve compact growth contained within the NPF and will realise the efficient use of currently underutilised brownfield land with higher housing density that is well served by public transport.

The effect is likely and will have a permanent significant positive effect that will achieve local and wider county, regional and national objectives.

*Human Health*

Construction sites pose potential risks to the health and safety of the public. However, access by the public would be considered trespassing on private property.

With mitigation in place, the effect is unlikely and neutral and not significant.

It should be noted that the potential for effects on human health during the construction phase are dealt with in this EIAR under the more specific topics of the environmental media by which they might be caused including air, traffic, and noise.

*Population and Economic Activity*

A key characteristic of the proposed development in terms of its potential economic impact relates to its capital value, of which a significant portion will be for the purchase of Irish sourced goods and services. The construction phase will provide a boost for the local construction sector in terms of employment generation and capital spend on materials and construction labour costs.

It is expected that during peak activities, approximately 100-120 people will be working directly on the construction site. The staff will comprise of managerial, technical, skilled and unskilled workers. As far as practicable local labour will be employed. It is unlikely that the proposed development will increase the population of the area as a result of the construction phase.

In addition to direct employment, there will be substantial off-site employment and economic activity associated with the supply of construction materials and provision of services such as professional firms

supplying financial, architectural, engineering, legal and a range of other professional services to the project.

Revenue generated during the construction phase will have an associated benefit for the local area with respect to expenditure on local goods and services.

The impact of the construction phase will at least extend to the county in terms of the requirement for labour, goods, and services. The effect will be significant, positive, and short-term.

*Local Amenities*

Construction works and emergence of the new structures will be seen in the context of existing views of surrounding public roads and industrial buildings. Many of these are significant developments, which will have the effect of backgrounding and contextualising the proposed works.

Works to the public road will require a road opening licence and temporary closures may be required. The impact of these works is neutral, not significant, and temporary.

Any effects will be slight, localised, and short-term in duration. Please refer to Chapters 5, 6, 11 and 12 of this EIAR for information on the effects on landscape and visual, traffic, noise, and air quality.

### 17.4.3 Operational Phase

*Land Use*

The proposed development complies with the statutory land use zoning. It will deliver 319no. residential units.

Given the existing housing crisis, it is anticipated that a high-density development at this location would result in a likely significant positive impact with a permanent duration as it would realise the objectives of urban consolidation through the efficient use of a zoned and serviced landbank to provide *inter alia* much needed housing, together with high-quality amenities for future occupants.

*Human Health*

The proposed design provides for the segregation of pedestrians and traffic and incorporates the principles of universal access 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 and less dependence on fossil fuels for energy generation with a resultant improved air quality and thus the impact is likely to be locally significant, positive and of permanent duration.

Adequate and appropriate exposure to light is critical for health and well-being. Light impacts human health and performance by enabling performance of visual tasks, controlling the body's sleeping and waking system and affecting mood and perception.

Having regard to the Daylight Sunlight and Overshadowing report prepared by BPC, and included with the planning application, it can be determined that there is no impact on residential uses in the vicinity and the proposed development can be concluded to meet and exceed BRE recommendations.

Insufficient physical activity has been identified by the World Health Organisation as the fourth leading risk factor for global mortality. Urban air pollution and traffic injuries are also responsible for a further 2.6 million deaths annually. The proposed scheme prioritises both pedestrian and cyclists and thus promotes active movements for future occupants. The health benefits of active transport (walking and cycling combined with public transport) can prevent many of these deaths from physical inactivity.

The proposed a riverside public park will result in likely, significant positive effects on the health, both mental and physical, of residents of the scheme and those in the immediate area.

*Population and Economic Activity*

In terms of the operational phase, the potential employment opportunities will be limited, given the fact that residential is the predominant land use proposed. Notwithstanding this, there will be additional employment from the proposed creche element. The economic impact of the operational phase on the immediate area would therefore be likely, permanent, slight, and positive.

The provision of 319no. quality homes within the proposed development will have a likely significant permanent positive impact on the population of Cork City, contributing to the city's growth in a compact manner and accommodating a substantial portion of the planned population growth of the city. It is envisaged that the proposed development will accommodate a projected full-time residential population of approximately 877 persons[2]. This population will generate additional spending within the area which will likely have a permanent moderate positive impact on economic activity in the Kilbarry area. This increase in population will also support the ongoing and future enhanced provision of an efficient public transport system.

*Local Amenities and Services*

The proposed layout provides for excellent public amenity and recreational facilities, including a riverside public park. The provision of amenity facilities within the development will be of benefit to future residents and existing residents in the local environs.

Using the average family size of 2.75 persons per unit, based on the average household size recorded by the State in the 2016 Census, 319no. units will yield a population of 877 persons. Census 2016 data indicates that there are 19,541 no. (9.4%) children in the 5-12 (primary school going) age bracket in Cork City and Suburbs. The proposed development would therefore likely result in an additional 71 no. children of primary school going age in the settlement.

It is also illustrated that 8.4% of the population of the study area are in secondary school going age range (13-18 years). Using this percentage as a basis, it can be approximated that the proposed development will result in demand for an additional 74 no. secondary school spaces being generated.

[2] Based on the average national household size of 2.75 people per household (CSO, 2016).

It is considered that there is adequate capacity within the existing schools to cater for the likely demand to be generated from the proposed development.

### 17.4.4 Cumulative Effects

The most likely cumulative effect of the proposed development, with regard to population and human health, is the demand it will place on local infrastructure and services. As is demonstrated in the preceding sections, there is adequate capacity available within the identified local schools to cater for the projected effect.

The Cork Metropolitan Area Transport Strategy 2040 (National Transport Authority, 2020) outlines proposals for improved public transport provision within Cork City and includes the construction of the Northern Distributor Road adjacent the site. This is to be a key public transportation route across the northside of the city. It is determined that the realisation of this strategy will adequately cater for the potential increased demand on local infrastructure arising from the proposed development.

As the preferred route of the Northern Distributor Road has still not been decided, it is very unlikely that the construction of the road will coincide with the construction of the proposed development.

Even if the construction phase of the Northern Distributor Road project coincides for a period of time with that of the proposed development, given its temporary nature, the likelihood of any significant cumulative effect on population and human health is considered low and short term.

No cumulative effects on population and human health are predicted to arise from the proposed development during the operational phase.

## 17.5 Mitigation Measures and Monitoring

### 17.5.1 Construction Phase

A site Construction and Environmental Management Plan (CEMP) will be prepared by the selected contractor prior to work commencing on site. The main purpose of a CEMP is to provide a mechanism for implementation of the various mitigation measures which are described in this EIAR. An outline Construction Management Plan prepared by JB Barry Consulting Engineers is included with the planning application.

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

Project supervisors for the construction phase will be appointed in accordance with the Health, Safety and Welfare at Work (Construction Regulations) 2013, and a Preliminary Health and Safety Plan will be formulated during the detailed design stage which will address health and safety issues from the design stages, through to the completion of the construction phases.

Adherence to the construction phase mitigation measures presented in this EIAR will ensure that the construction of the proposed development will have an imperceptible and neutral impact in terms of health and safety.

### 17.5.2 Operational Phase

The proposed development has been designed to avoid negative impacts on population and human health through;

- Incorporating extensive leisure and amenity facilities within the layout, including the provision of a large amenity park and extensive provision for walking and cycling throughout the development;
- Landscaping to mitigate against issues arising from microclimate conditions;
- The inclusion of a comprehensive foul and surface water management system;
- Energy efficient measures; and,
- High quality finishes and materials.

No significant risks to population and human health have been identified in relation to the operational phase of the development. Accordingly, no further mitigation measures are required.

### 17.5.3 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.

Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission.

Monitoring of compliance with Health & Safety requirements will be undertaken by the Project Supervisor for the Construction Process.

## 17.6 Residual Effects

It is anticipated that the proposed development will realise significant positive overall economic and social benefits for the local community and the wider Cork City area.

Strict adherence to the mitigation measures recommended in this EIAR will ensure that there will be no negative residual impacts or effects on population and human health from the construction and operation of the proposed scheme. Indeed, the delivery of much needed housing and student accommodation will realise a likely significant positive effect for the local area.

### 17.6.1 Worst Case Scenario

The worst-case scenario where mitigation measures failed for a development of the type proposed is considered to be the risk of an accident during the construction phase. This is considered highly unlikely and indeterminable.

## 17.7 References

National Planning Framework, Ireland 2040 – Our Plan (Government of Ireland, 2018);

Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities) (Department of Housing, Planning and Local Government) (March 2018);

Childcare Facilities (Guidelines for Planning Authorities) (June 2001);

Regional Spatial and Economic Strategy for the Southern Region (2020);

Cork City Development Plan 2022-2028;

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);

Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018);

Cork Metropolitan Area Transport Strategy 2040 (National Transport Authority, 2020);

Central Statistics Office (CSO) website: www.cso.ie; and

Department of Education and Sciences (DES) website: www.education.ie.

## 18.0 MAJOR ACCIDENTS AND DISASTERS

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**Figures, Plates and Tables**

## 18.1 Introduction

This chapter has been prepared by Coakley O'Neill Town Planning Ltd. The lead author is Dave Coakley, Director, Coakley O'Neill Town Planning Ltd, who graduated as a town planner from the University of West England in 2005, and holds the qualifications of BA (Hons), MPhil, MTCP, MIPI, and has worked in the public and private sector in Cork since 2001. Dave has over 20 years professional experience in the field of planning, which has included providing consultancy services in respect of several urban development, infrastructural development, and tourism development including EIA.

This chapter describes the likely significant negative effects arising from the vulnerability of the proposed development to risks of major accidents and/or disasters. This assessment has been carried out in compliance with the EIA Directive 2014/52/EU of the European Parliament and the Council of 16 April 2017 (amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment) which states the need to assess:

> *"the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned"*

The underlying objective of this assessment is to ensure that appropriate precautionary actions are taken for any development projects which *"because of their vulnerability to major accidents and/or natural disasters, are likely to have significant adverse effects on the environment*".

The following paragraphs are set out in the EIA Directive in relation to major accidents and/or disasters.

Recital 15 of the EIA Directive states that:

> *"In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU of the European Parliament and the Council and Council Directive 2009/71/Euratom, or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met."*

Note: Directive 2012/18/EU is the directive on the control of major-accident hazards involving dangerous substances, referred to as the COMAH or Seveso III Directive.

Article 3 of the EIA Directive provides that the EIAR shall identify, describe, and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil,

water, air and climate, material assets, cultural heritage and landscape deriving from (amongst other things) the "*vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned*".

Specifically, the information relevant to major accidents and/or disasters to be included in the EIAR is set out in Section 8 of Annex IV of the EIA Directive as follows:

> *"(8) A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this 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 such emergencies".*

Based on the requirements of the EIA Directive, this chapter seeks to determine:

- The relevant major accidents and/or disasters, if any, that the proposed development could be vulnerable to,
- The potential for these major accidents and/or disasters to result in likely significant adverse environmental effect(s), and
- The measures that are in place, or need to be in place, to prevent or mitigate the likely significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

## 18.2 Assessment Methodology

### 18.2.1 Categorisation of the Baseline Environment

A desk-based study has been undertaken to establish the baseline environment on which the risk assessment is being carried out, as this will influence both the likelihood and the impact of a major accident and/or disaster.

This assessment has considered the following guidance:

- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- EPA Guidelines (EPA, 2022)
- The Framework for Major Emergency Management and associated protocol and guidance documents; preparing a major emergency plan and risk assessment (Government of Ireland, 2010)
- The National Risk Assessment (Government of Ireland 2019)

### 18.2.2 Impact Assessment Methodology

*General*

The scope and methodology of this assessment is centred on the understanding that the proposed development will be designed, built and operated in line with best international current practice and, as such, the vulnerability of the proposed development to risks of major accidents and/or disasters is considered low.

Current EIA practice already includes an assessment of some potential accidents such as pollution incidents to ground and watercourses as well as assessment of flooding events. These are described in detail in the relevant EIAR assessment chapters (refer to Chapters 14 *Land, Soils & Geology* and 15 *Water* for further detail).

*Site Specific Risk Assessment Methodology*

This section identifies the potential of unplanned but potential events that could occur during construction and operation of the proposed development. Risks are set out according to the classification of risk, taken from the Guide to Risk Assessment in Major Emergency Management (2010).

| Ranking | Classification | Likelihood |
|---|---|---|
| 1 | Extremely Unlikely | May occur only in exceptional circumstances; once every 500 or more years |
| 2 | Very Unlikely | Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; may occur once every 100-500 years. |
| 3 | Unlikely | May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisation's worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years. |
| 4 | Likely | Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years |
| 5 | Very Likely | Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year. |

**Table 18.1: Risk Clarification Table - Likelihood**

*Classification of Consequence*

The risks are then tested in terms of consequences. It should be noted that when categorising the Consequence Rating, the rating assigned assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. In addition, Cork City Council have in place a 'Major Emergency Plan' which, if implemented as intended, will work to reduce the effect of any major accident or disaster.

| Ranking | Consequence | Impact | Description |
|---|---|---|---|
| 1 | Minor | Life, Health, Welfare<br>Environment<br>Infrastructure<br>Social | Small number of people affected; no fatalities and small number of minor injuries with first aid treatment.<br>No contamination, localised effects <€0.5M Minor localised disruption to community services or infrastructure (<6 hours). |
| 2 | Limited | Life, Health, Welfare<br>Environment<br>Infrastructure<br>Social | Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements.<br>Simple contamination, localised effects of short duration<br>€0.5-3M<br>Normal community functioning with some inconvenience. |
| 3 | Serious | Life, Health, Welfare<br>Environment<br>Infrastructure<br>Social | Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation.<br>Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated.<br>External resources required for personal support.<br>Simple contamination, widespread effects or extended duration<br>€3-10M<br>Community only partially functioning, some services available. |
| 4 | Very Serious | Life, Health, Welfare<br>Environment<br>Infrastructure<br>Social | 5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated<br>Heavy contamination, localised effects or extended duration<br>€10-25M<br>Community functioning poorly, minimal services available |
| 5 | Catastrophic | Life, Health, Welfare<br>Environment<br>Infrastructure<br>Social | Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated.<br>Very heavy contamination, widespread effects of extended duration.<br>>€25M<br>Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support. |

**Table 18.2: Risk Classification Table – Consequence.**

The impact ratings are taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010).

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Likelihood Rating** | Very Likely | 5 | | | | | |
| | Likely | 4 | | | | | |
| | Unlikely | 3 | | | | | |
| | Very Unlikely | 2 | | | | | |
| | Extremely Unlikely | 1 | | | | | |
| | | | Minor | Limited | Serious | Very Serious | Catastrophic |
| | | | 1 | 2 | 3 | 4 | 5 |
| | | | **Consequence Rating** | | | | |

**Table 18.3: Risk Matrix**

## 18.3 Baseline Environment

### 18.3.1 Disasters

Ireland's geographic position means it is less vulnerable to natural disasters such as earthquakes or tsunamis, which might pose risk to projects of this nature and scale in other locations. Whilst there has been no natural disaster of relevance in recent years, there has been an increase in the number of extreme weather events in the country, particularly those leading to severe weather conditions including flash flooding, snow and strong wind gusts. For the more recent severe weather events (Storm Ophelia, October 2017, Storm Emma February 2018) the Cork City Major Emergency Plan was activated. Storm Barra December 2021. For Storm Barra in December 2021, Cork City Council activated its Severe Weather Plan. With regard to disasters, severe weather conditions pose a plausible potential risk to the proposed development.

### 18.3.2 Major Accidents

According to Cork City the Major Emergency Plan there have been incidents in Cork City which necessitated the activation of the Plan. Such incidents included a multi vehicle road traffic collision in the city centre involving a bus and several cars (June 2007) and the plane crash at Cork Airport (2012). Following the completion of risk assessments by Cork City, a number of risks within the functional area were identified which had various implications for the Local Authority. These risk assessments were prepared with regard to other existing emergency plans for facilities within the city e.g., Port of Cork Emergency Plan, Kent Rail Interagency Emergency Plan, Jack Lynch Tunnel Interagency Emergency Plan.

*Licenced Facilities - Seveso sites*

The European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations, 2015 (SI 209 of 2015) implement the requirements of the Council Directive 2012/18/EU on the control of major accident hazards involving dangerous substances. These Regulations require operators of establishments where dangerous substances are used or stored in large quantities to take all measures necessary to prevent and mitigate the effects of major accidents to man and the environment.

Establishments which fall under the remit of the Seveso III Regulations are classified as either "lower tier" or "upper tier" sites. There are five Seveso sites within the Cork City functional area. As can be seen from Table 18.4 all Seveso sites are located over 1km from the proposed development.

| Name | Tier | Activity | Distance from Proposed Development Site |
|---|---|---|---|
| Gouldings Chemicals Ltd Docklands | Lower | Production and/or storage of fertilisers | 3.6km - South |
| Flogas Ireland Ltd Tivoli | Upper | Liquefied Petroleum Gas storage | 5km - Southeast |
| Calor Teoranta Tivoli | Upper | Liquefied Petroleum Gas storage | 5km - Southeast |
| Chemical Bulk Storage Ltd Tivoli | Lower | Chemical installations | 5km- Southeast |
| Grassland Agro Carrigrohane | Upper | Production and/or storage of fertilisers | 5.4km - Southwest |

**Table 18.4: Seveso Sites in relation to proposed development.**

The nearest facility to the proposed development is Gouldings Chemicals Ltd. In accordance with the Regulations operators of a "Lower Tier Establishment" are to develop a site-specific Major-Accident Prevention Policy (MAPP) which is implemented by site specific procedures and systems. The proposed development is not within the consultation distance for Goulding Chemicals Ltd.

The nearest site to the proposed development which has a licence issued by the EPA is Dulux Paints Ireland Limited on the Commons Road. This facility is located approximately 500m south-west of the proposed development site and is involved in chemicals.

## 18.4 Likely Significant Effects

### 18.4.1 Do Nothing

If the proposed development does not proceed, there will be no increase in the likelihood of major accidents occurring, or indeed the consequences should a major accident occur. There will be no change to the likelihood or consequences of a disaster, therefore the site would remain the same as it is currently.

### 18.4.2 Direct Effects

**Construction**

A risk register will be developed which contains the risks specific to the construction phase of the proposed development and possible causes. An outline of the relevant considerations is presented in Table 18.5**.**

| Risk ID | Potential Risk | Possible Cause |
|---|---|---|
| Potential to cause major accidents and/or disasters | | |
| C1 | Structural collapse and/or damage to existing structures | Vehicle collision / accidental damage to existing structures<br>Vibration from ground works/ excavations |
| C2 | Contamination of water courses (surface and ground water) | Uncontrolled discharge of pollutants due to fuel spill / leaks<br>Equipment and/or power failure |
| C3 | Collison of construction vehicles with members of the public | Collisions with other road users, pedestrians, cyclists due to increase in construction traffic entering and leaving site. |
| C4 | Fire/ Explosion | Construction vehicle or machinery collision<br>Ignition of fuels on site<br>Strikes to underground services |
| C5 | Incident at IE licenced site leading to fire/explosion or pollution of water courses and/or release of harmful substances into the atmosphere. | - Equipment or power failure<br>- Vehicle / plant machinery collision |

**Table 18.5: Risk Register – Direct Effects during Construction Phase**

**Operation**

A risk register will be developed which contains the identified risks specific to the operational phase of the proposed development. These are presented Table 18.6 and discussed in detail below.

| Risk ID | Potential Risk | Possible Cause |
|---|---|---|
| Potential to cause major accidents and/or disasters | | |
| Op1 | Explosion/fire | - Electrical faults<br>- Use of flammable/combustible materials |
| Op2 | Pollution of water courses – surface and ground water | - Equipment failure or power outage leading to uncontrolled discharge |
| Op3 | Collision with vehicles/pedestrians/cyclists etc | - Increase in operational traffic |
| Op4 | Personal injury | - Effects of severe winds |

**Table 18.6: Risk Register – Direct Effects during Operational Phase**

### 18.4.3 Indirect Effects

**Construction and Operational Phase**

A risk register will be developed which contains the common indirect risks specific to the construction and operation phases of the proposed development and possible causes. An outline of these is presented in Table 18.7.

| Risk ID | Potential Risk | Possible Cause |
|---|---|---|
| C5 & Op4 | Incident at IED site leading to fire/explosion or pollution of water courses and/or release of harmful substances into the atmosphere. | - Equipment or power failure<br>- Vehicle / plant machinery collision<br>- Sabotage/arson leading to ignition of fuel and/or explosion |
| C1 & Op4 | Extreme weather events affecting infrastructure. | - Flooding<br>- High winds/ storms<br>- Extreme temperature (primarily low temperatures giving rise to adverse snow/ice conditions) |

**Table 18.7: Risk Register- Potential indirect effects during Construction & Operational Phase**

**Risk Assessment**

Table 18.8 categorises each of the potential risks by their 'risk score.' A corresponding risk matrix is provided in Table 18.9, which is colour coded, the red zone represents 'high risk scenarios', the amber zone represents 'medium risk scenarios' and green represents 'low risk scenarios'.

| Risk ID | Potential Risk | Likelihood Rating | Consequence Rating | Risk Score |
|---|---|---|---|---|
| C1 | Structural collapse and/or damage to existing structures including quay walls | 1 | 4 | 4 |
| C2 | Contamination of water courses (surface and ground water) | 3 | 2 | 6 |
| C3 | Collison of construction vehicles with members of the public | 2 | 2 | 4 |
| C4 | Fire/ Explosion | 1 | 3 | 3 |
| C5 | Incident at IE facility | 1 | 3 | 3 |
| Op1 | Explosion/fire | 1 | 3 | 3 |
| Op2 | Pollution of water courses – surface and ground water | 1 | 2 | 2 |
| Op3 | Collision with vehicles/pedestrians/cyclists etc | 2 | 2 | 4 |
| Op4 | Personal injury | 1 | 4 | 4 |

**Table 18.8: Risk Scores for Construction Phase (C) and Operational Phase (Op)**

| Likelihood Rating | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Very Likely | 5 | | | | | |
| | Likely | 4 | | | | | |
| | Unlikely | 3 | | C2 | | | |
| | Very Unlikely | 2 | | C3 | | | |
| | Extremely Unlikely | 1 | C1, C4, C5, Op1, Op2, Op4 | Op3 | | | |
| | | | Minor | Limited | Serious | Very Serious | Catastrophic |
| | | | 1 | 2 | 3 | 4 | 5 |
| | | | **Consequence Rating** | | | | |

**Table 18.9: Risk Matrix – Construction and Operational Phase**

No plausible potential risks were identified which would result in the proposed development causing a major accident or disaster on or outside of the proposed development.

## 18.5 Mitigation Measures and Monitoring

### 18.5.1 Mitigation

**Mitigation during Construction**

All potential risks, direct and indirect, identified during the construction phase were determined to be 'low risk scenarios'. A detailed CEMP will be prepared by the contractor and implemented throughout the works. The CEMP will be a live document and continuously updated to ensure that potential risks of major accidents and/or disasters are identified, avoided, and mitigated as necessary.

**Mitigation during Operation**

The fire risk mitigation for the apartments and creche building will comprise all fire safety measures necessary to comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2017. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2018 from Cork City Council/Cork City Fire Brigade.

Otherwise, the proposed development will be designed and built and managed in line with best international current practices and as such mitigation against the risk of major accidents and/ or disasters will be embedded throughout the design stage. All potential risks, direct and indirect, identified during the operation phase were determined to be 'low risk scenarios'.

### 18.5.2 Monitoring

**Monitoring during Construction**

Aside from the monitoring measures to be carried out by the contractor, as outlined in the CEMP (e.g., site inspections and audits) and throughout the EIAR, no additional monitoring is considered necessary during the construction phase of the proposed development.

**Monitoring during Operation**

No additional monitoring is considered necessary during the operational phase of the proposed development.

## 18.6 Residual Effects

### 18.6.1 Residual Effects during Construction

The risk of a major accident and/or disaster during the construction of the proposed development is considered 'low' in accordance with the risk evaluation methodology. It is considered that the proposed development will not give rise to significant residual effects.

### 18.6.2 Residual Effects during Operation

The risk of a major accident and/or disaster during the operation of the proposed development is considered 'low' with regards the risk evaluation methodology. It is therefore considered that there is no significant residual effect(s) during the operation of the proposed development.

## 18.7 Cumulative Effects

A number of local developments have the potential to give rise to cumulative adverse effects on the environment as a result of a major accident and/ or disaster.

Other permitted or proposed developments considered include the following:

Old Whitechurch Road – Cork City Council Lands

Planning permission was granted to Cork City Council under a Part 8 Planning Application for the carrying out of enabling infrastructural work at their landbank on the Old Whitechurch Road. The Infrastructural works include the following:

- the under-grounding of overhead power and communications lines, which will require the removal of metal masts and wooden poles, and the erection of new 'line cable interface' masts:
- the creation of a new junction and improvements on the Old Whitechurch Rd and Old Mallow Rd;
- the provision of a spine access/trunk road including ducting for electricity, gas, Eir and Virgin Media;
- the provision of water, foul and surface water drainage services for Irish Water and the council;

- and connecting existing services to the site including works in the adjacent Kilbarry 110KB substation to facilitate the under-grounding of overhead cables.

This application was funded by the Government's Local Infrastructure Housing Activation Fund (LIHA), to allow for the provision of enabling infrastructure which will help prime the site to deliver at least 600no. homes, many aimed at the affordable housing market. Enabling works have commenced and the City Council has issued a request for expressions of interest from developers to become involved in the development of the project.

LDA Lands Kilbarry

The LDA site in Kilbarry have a proposed zoning of Tier 2 Residential and are designated as a Longer Term Strategic Development whereby a masterplan will be prepared to ensure that the residential zoned lands integrate with the wider Kilbarry area and correlate to the Blackpool-Kilbarry Framework Plan which is to be prepared by Cork City Council.

Northern Distributor Road

The preferred route for the northern distributor road as confirmed by Cork City Council is north of Delaney Rovers GAA and through the IDA/LDA lands.

Cork City Council have also confirmed that the Strategic Assessment Report (SAR) for the Northern Distributer Road is currently being reviewed by the National Transport Authority. They expect to receive NTA feedback in the coming weeks. Thereafter the SAR will be finalised and resubmitted. This will then be followed by public consultation on the emerging preferred route. The preferred route will then be confirmed following public consultation.

The potential for the accident scenarios considered in this chapter affecting these other projects was considered, and the overall conclusions regarding risk and consequence remains as described in the detailed risk score tables.

## 18.8 References

Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations (OJ L 172, 2.7.2009, p.18)

Department of the Environment Heritage and Local Government (2010) A Guide to Risk Assessment in Major Emergency Management. Available from: http://mem.ie/wp-content/uploads/2015/05/A-Guide-to-Risk-Assessment.pdf

Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment

Directive 2012/18/EU of the European Parliament and the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (OJ L 197, 24.7.2012, p. 1).

Directive 2014/52/EU of the European Parliament and the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment

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# 19.0 CUMULATIVE AND INTERACTIVE EFFECTS

**Contents**



**Figures, Plates and Tables**

## 19.1 Introduction

This chapter has been prepared by Coakley O'Neill Town Planning Ltd. The lead author is Dave Coakley, Director, Coakley O'Neill Town Planning Ltd, who graduated as a town planner from the University of West England in 2005, and holds the qualifications of BA (Hons), MPhil, MTCP, MIPI, and has worked in the public and private sector in Cork since 2001. Dave has over 20 years professional experience in the field of planning, which has included providing consultancy services in respect of several urban development, infrastructural development, and tourism development including EIA.

This chapter summarises the residual effects that have been identified in Chapters 7 – 19 and determines whether they give rise to cumulative and/or interactive effects based on best scientific knowledge. Accordingly, when a topic is not mentioned, the authors have concluded that there are no likely residual significant effects that could give rise to cumulative and/or interactive effects. Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from and this EIAR will look at:

- the interaction between all of the different permitted and planned projects in the same area in combination with this proposed development; and
- the interaction between the various effects within this proposed development.

Cumulative effects will consider whether the addition of many minor or significant effects of the proposed development itself or the cumulation of effects of other permitted or planned projects have the potential to result in larger, more significant effects when combined with the effects of the proposed development. Interactive effects will consider the interaction between the various environmental aspects, for example the interaction between noise and ecology.

## 19.2 Assessment Methodology

### 19.2.1 Overview

The assessment of cumulative effects has been undertaken on a qualitative basis by each of the environmental topic leads based on best scientific knowledge. The approach has aligned with the overarching EIA guidance as outlined in Section 1.3.3 of Chapter 1 (including the EPA guidance (2022) and EC guidance) as well as per the methodology adopted for each environmental factor as described in Chapters 7 – 18. A summary of these effects is provided herein based on best scientific knowledge.

### 19.2.2 Cumulative Effects

The EIAR has considered and assessed cumulative effects arising from the construction and operation of the proposed development. A cumulative assessment has been undertaken based on best scientific knowledge in accordance with Part 5(e) of Annex IV of the EIA Directive:

> *"e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;*

At the initial stage of preparing the EIAR for the proposed development, the potential for significant cumulative impacts were examined and any potential effects were identified. These potential effects were included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental factors.

Likely significant cumulative effects of the proposed development in-combination with other existing and/or approved projects for each of the environmental factors were initially identified, considered, and assessed in respective chapters of the EIAR.

### 19.2.3 Interactive Effects

The EIAR has considered and assessed the interactive effects arising from the construction and operation of the proposed development based on best scientific knowledge. Interactive effects (or interactions), as defined in Section 20.1 above specifically refer to any direct or indirect effects caused by the interaction of environmental factors as outlined in Part 1(e) in Article 3 of the EIA Directive which states:

> *"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) population and human health;*
>
> *(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
>
> *(c) land, soil, water, air and climate;*
>
> *(d) material assets, cultural heritage and the landscape;*
>
> *(e) the interaction between the factors referred to in points (a) to (d)."*

## 19.3 Cumulative Effects

### 19.3.1 Overview

The assessment of cumulative effects has considered likely significant effects that may arise during the construction and operation of the proposed development.

Cumulative effects were assessed to a level of detail commensurate with the information that was available at the time of assessment based on best scientific knowledge.

The assessment specifically considers whether any of the proposed and/or recently approved schemes in the local area have a potential to exacerbate (i.e., alter the significance of) effects associated with the proposed development based on best scientific knowledge. Proposed and existing developments in close proximity to the proposed development site which are most likely to result in cumulative effects arising from the construction and operation of the proposed development are outlined in Table 19.1. Any other existing projects not identified in this chapter, do not have the potential to exacerbate effects.

| NUMBER | LOCATION | DESCRIPTION | STATUS |
|---|---|---|---|
| 1. | Whitechurch Road | <u>Cork City Council LIHAF Lands</u><br>Planning permission was granted to Cork City Council under a Part 8 Planning Application for the carrying out of enabling infrastructural work at their landbank on the Old Whitechurch Road. The Infrastructural works include the following:<br>• the under-grounding of overhead power and communications lines, which will require the removal of metal masts and wooden poles, and the erection of new 'line cable interface' masts:<br>• the creation of a new junction and improvements on the Old Whitechurch Rd and Old Mallow Rd;<br>• the provision of a spine access/trunk road including ducting for electricity, gas, Eir and Virgin Media;<br>• the provision of water, foul and surface water drainage services for Irish Water and the council;<br>• and connecting existing services to the site including works in the adjacent Kilbarry 110KB substation to facilitate the under-grounding of overhead cables.<br><br>This application was funded by the Government's Local Infrastructure Housing Activation Fund (LIHA), to allow for the provision of enabling infrastructure which will help prime the site to deliver at least 600no. homes, many aimed at the affordable housing market. Enabling works have commenced and the City Council has issued a request for expressions of interest from developers to become involved in the development of the project. | No works have commenced as yet |

| | | | |
|---|---|---|---|
| 2. | Kilbarry | LDA Lands Kilbarry<br>IDA lands in Kilbarry to the east of the site have a proposed zoning of Tier 2 Residential and are also designated as a Longer Term Strategic Development whereby a masterplan will be prepared to ensure that the residential zoned lands integrate with the wider Kilbarry area and correlate to the Blackpool-Kilbarry Framework Plan which is to be prepared by Cork City Council. These lands are to be transferred to the LDA for future residential development. | No works have commenced as yet |
| 3. | Kilbarry | Northern Distributor Road<br>The preferred route for the northern distributor road as confirmed by Cork City Council is north of Delaney Rovers GAA and through the IDA/LDA lands.<br><br>Cork City Council have also confirmed that The Strategic Assessment Report (SAR) for the Northern Distributer Road is currently being reviewed by the National Transport Authority. They expect to receive NTA feedback in the coming weeks. Thereafter the SAR will be finalised and resubmitted. This will then be followed by public consultation on the emerging preferred route. The preferred route will then be confirmed following public consultation. | No works have commenced as yet |

**Table 19.1: Cumulative Projects.**

### 19.3.2 Cumulative Effects During Construction

Possible cumulative effects during construction are outlined in the individual assessment chapters of this EIAR – Chapter 7 through Chapter 18. It is concluded that should the construction of any of the developments mentioned in Table 19.1 above occur concurrently, the potential cumulative construction effects are not considered significant, given the implementation of standard construction environmental measures, the Construction Environmental Management Plan for the proposed development and a Construction Traffic Management Plan.

### 19.3.3 Cumulative Effects During Operation

Possible cumulative effects during operation are outlined in the individual assessment chapters of this EIAR – Chapter 7 through Chapter 18.

Potential cumulative operational effects are not considered significant.

## 19.4 Potential Interactions

### 19.4.1 Population and Human Health

During the construction phase, the following aspects would interact with population and human health and in the absence of mitigation may give rise to likely significant effects:

**Traffic and Transportation**: Traffic flow for construction vehicles in the locality has potential to impact upon road safety.

**Noise & Vibration**: There is potential for impact on human health associated with noise and vibration during the construction phase.

**Water and Material Assets**: There is the potential for stoppages of existing water supplies during the construction period.

**Major Accidents and Disasters:** There is the potential for accidents during the construction phase.

**Air Quality & Climate:** There is potential for impact on human health from dust associated with construction activities.

During the operational phase the potential interactions are:

**Landscape**: The landscape plan will impact on the quality of the private and public open spaces, which could impact on people's health and well-being.

**Noise & Vibration**: The increased population and activity in the area may result in increased noise and vibration for established residential areas in the vicinity of the proposed development site.

**Traffic and Transportation:** Traffic flows within the site has the potential to create safety risks for pedestrians and cyclists.

**Water**: There is the potential for flooding in the riverside park along the river, given its Flood Zone status.

**Major Accidents and Disasters:** There is the potential for accidents, e.g., from fire, or wind, during the operational phase.
**Air Quality & Climate:** There is potential for impact on human health from a deterioration in air quality associated with emissions from vehicles.

The potential significant impact on population and human health have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.2 Landscape and Visual

During the construction phase, the following aspects would interact with visual and in the absence of mitigation may give rise to likely significant effects:

**Land & Soils:** There is potential for impact on landscaping from the earth remodelling works during the construction phase.

During the operational phase the potential interactions are:

**Population & Human Health:** The nature and extent of the proposed development will have a visual impact on the local population's views and perceptions of their environment. The landscape plan will impact on the quality of the private and public open spaces, which will impact on people's health and well-being.

**Biodiversity:** The landscaping has significant interaction with biodiversity in relation to the planting.

The potential significant impacts of landscape and visual have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.3 Traffic and Transportation

During the construction phase, the following aspects would interact with traffic and transportation and in the absence of mitigation may give rise to likely significant effects:

**Noise & Vibration:** Construction traffic may give rise to localised noise and vibration effects.

**Air Quality and Climate:** Emissions from construction traffic may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles.

During the operational phase the potential interactions are:

**Air Quality and Climate:** Emissions from traffic associated with future occupants may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles.

The potential significant impacts of traffic and transportation have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.4 Material Assets

During the construction phase, the following aspects would interact with built services and in the absence of mitigation may give rise to likely significant effects:

**Population & Human Health**: Connections to existing services may require a temporary interruption to existing services in the local area.

**Water & Hydrology:** The construction of the proposed services (water supply, drainage and IT etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids run off.

During the operational phase the potential interactions are:

**Water & Hydrology:** There will be an increased demand on water supply.

**Air Quality and Climate**: The built services have an interaction with climate in the availability and use of non-greenhouse gas reliant power and heat sources.

The potential significant impacts of material assets have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.5 Land and Soils

During the construction phase, the following aspects would interact with land and soils and in the absence of mitigation may give rise to likely significant effects:

**Land & Soils:** There is potential for impact on landscaping from the earth remodelling works during the construction phase.

**Water & Hydrology:** Site preparatory works (i.e. site clearance, re-profiling etc.) during the construction stage have the potential to impact on the hydrology and hydrogeology due to the risk of suspended solids becoming entrained in surface water runoff and accidental spills etc.

**Biodiversity:** Site preparatory works have the potential to cause impact on the biodiversity of the site, through removal and disturbance of habitats and species.

**Archaeology:** Site clearance works may impact on sub-surface archaeology.
No potential operational interactions have been identified.

The potential significant impacts of land and soils have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.6 Water and Hydrology

During the construction phase, the following aspects would interact with water and hydrology and in the absence of mitigation may give rise to likely significant effects:

**Material Assets:** The construction of the proposed services (water supply, drainage and IT etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids run off.

**Land & Soils:** Site preparatory works (i.e. site clearance, re-profiling etc.) during the construction stage have the potential to impact on the hydrology and hydrogeology due to the risk of suspended solids becoming entrained in surface water runoff and accidental spills etc.

**Biodiversity:** Any negative impact on water quality may impact biodiversity.
During the operational phase the potential interactions are:

**Material Assets:** There will be an increased demand on potable water supply and on the municipal drainage system, as well as an increase in surface water flow.

The potential significant impacts of water and hydrology have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.7 Biodiversity

During the construction phase, the following aspects would interact with biodiversity and in the absence of mitigation may give rise to likely significant effects:

**Land & Soils:** Site preparatory works have the potential to cause impact on the biodiversity of the site, through removal and disturbance of habitats and species.

**Water & Hydrology:** Any negative impact on water quality arising from accidental spillages etc. may impact biodiversity.

**Noise and Vibration**: There is the potential for disturbance of species as a result of construction noise.

During the operational phase the potential interactions are:

**Landscape & Visual**: They quality of the landscaping plan and appropriateness of the species may significantly impact biodiversity, and

**Water & Hydrology:** Any negative impact on water quality arising from accidental spillages during the operational phase etc. may impact biodiversity.

The potential significant impacts of biodiversity have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.8 Noise and Vibration

During the construction phase, the following aspects would interact with noise and vibration and in the absence of mitigation may give rise to likely significant effects:

**Population & Human Health:** There is potential for impact on human health associated with noise and vibration generated during the construction phase.

**Traffic & Transport:** Construction traffic may give rise to localised noise and vibration effects.

No potential operational interactions were identified.

The potential significant impacts of noise and vibration have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.9 Air Quality and Climate

During the construction phase, the following aspects would interact with air quality and climate and in the absence of mitigation may give rise to likely significant effects:

**Population & Human Health:** There is potential for impact on human health from dust associated with construction activities.

**Traffic & Transport:** Emissions from construction traffic may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles.

During the operational phase the potential interactions are:

**Population & Human Health:** There is potential for impact on human health from a deterioration in air quality associated with emissions from vehicles.

**Traffic & Transportation:** Emissions from traffic associated with future occupants may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles.

**Material Assets:** The built services have an interaction with climate in the availability and use of non-greenhouse gas reliant power and heat sources. The potential significant impacts of Air Quality and Climate have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative interactive effects are predicted.

### 19.4.10 Architectural and Cultural Heritage

During the construction and operational phases no potential interactions are identified.

## 19.5 References

Cork City Council (2022) Search for a Planning Application Available at: https://www.corkcity.ie/en/councilservices/services/planning/search-for-aplanning-application/

Department of Housing, Planning and Local Government (2018) Circular PL05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive);

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Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022);

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## 20.0 SUMMARY OF MITIGATION, MONITORING AND RESIDUAL EFFECTS

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**Figures, Plates and Tables**

## 20.1 Introduction

This chapter has been prepared by Coakley O'Neill Town Planning Ltd. The lead author is Dave Coakley, Director, Coakley O'Neill Town Planning Ltd, who graduated as a town planner from the University of West England in 2005, and holds the qualifications of BA (Hons), MPhil, MTCP, MIPI, and has worked in the public and private sector in Cork since 2001. Dave has over 20 years professional experience in the field of planning, which has included providing consultancy services in respect of several urban development, infrastructural development, and tourism development including EIA.

A key objective of the Environmental Impact Assessment (EIAR) 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 7-18.

It is proposed that the appointed contractor will develop a site-specific Construction and Environmental Management Plan (CEMP) prior to works commencing on-site. All the mitigation measures proposed within the individual specialists' assessments will be incorporated into the plan.

## 20.2 Summary of Mitigation Measures

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| **Traffic and Transportation** | **Mobility Management Plan (MMP)**<br>An Mobility Management Plan (MMP) has been prepared to accompany the planning application for the proposed development, to encourage use of sustainable transport measures during the operational phase by residents and by staff working in the development.<br><br>**Construction Traffic Management Plan (CTMP)**<br>It is outlined in the TTA that a detailed Construction Traffic Management Plan (CTMP) will be prepared by the successful contractor in consultation with Cork City Council Roads and Transportation Department. This CTMP will address the requirement for pipe upgrading works, by Irish Water, on the Old Whitechurch Road at later phases of the development<br><br>The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction phase upon the public (off-site), existing private property owners on or adjacent to the site boundaries, occupiers of early phases of the development (adjacent to the construction works), visitors to the subject site (on-site) and internal (on-site) workers environment are fully considered and proactively managed/programmed, thereby ensuring that safety is maintained at all times, disruption is minimised, and that works are undertaken within a controlled, hazard-minimised environment. |

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| | As set out in the CEMP, competent traffic co-ordinator and banksmen will be appointed by the contractor to oversee the following control measures which will be implemented as part of the final CTMP to reduce the risks associated with construction traffic. Some of the following measures also tie in with mitigation measures for dust and noise.<br><br>▪ A detailed site plan/layout of the construction site will be developed to identify locations for site offices/storage areas/waste management areas etc.<br>▪ Entrances and exits – separate entry and exit gateways will be provided for pedestrians and vehicles with a gate attendant employed to interface with the traffic and public to facilitate safe access and egress of vehicles.<br>▪ Where employees will need to cross the construction route, a clearly signed and lit crossing point will be provided where drivers and pedestrians can see each other clearly.<br>▪ Visibility – the site operator will ensure that drivers driving out onto the public roads have the appropriate visibility splays.<br>▪ The existing site accommodates significant numbers of public, informal walkers who use the areas for amenity purposes. All such amenity routes will be cordoned-off from construction areas to ensure the safety of the public.<br>▪ All operators of construction machinery and vehicles will be trained and competent and have valid CSCS cards.<br>▪ All site staff will be made aware that there are employees and visitors to the GAA grounds in the surrounding areas using the construction access roads.<br>▪ Approach signage with good sightlines will be provided at the site access route and site entrance.<br>▪ Traffic management measures will be co-ordinated such that works on the main site and works on pipe upgrades on the Old Whitechurch Road, by Irish Water, are fully co-ordinated.<br>▪ Traffic management procedures will be communicated to suppliers and workers.<br>▪ Deliveries to site will be planned to arrive during working hours only, save for exceptional loads for which a detailed plan will be agreed with the local authority..<br>▪ The access routes to the construction site entrances and internal site routes will be kept in good condition and clear of obstructions.<br>▪ The contractor will put measures in place to mitigate any excessive noise for nearby properties that may be created during construction activities. |

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| | ▪ Internal trafficked areas will be watered twice daily on dry days to reduce dust, if required. Vehicles delivering or collecting material with dust potential will be covered with tarpaulin at all times to restrict the escape of dust.<br>▪ A stringent 'clean as you go' policy will be implemented on site to ensure no loose material is left on the ground within the construction access road and the public road.<br>▪ Vehicle wheel washing facilities will be in place for vehicles leaving the construction site area.<br>▪ A road sweep will be deployed if necessary to ensure the site access route between the site access and the Upper Dublin Hill junction, and the Old Whitechurch Road, will be kept clean at all times.<br>▪ Construction materials or equipment will not be stored outside the site boundary.<br>▪ Pedestrian/vehicular routes, crossing points, parking, loading and vehicle only areas will be clearly marked, signposted and segregated as appropriate.<br>▪ Where required site vehicles will be fitted with appropriate audible and visual devices.<br>▪ Loading and unloading will be carried out in a designated area within the construction site boundary and reversing activities will be kept to a minimum.<br>▪ Loads will be checked prior to unloading and loads will be adequately secured for travel.<br>▪ Visitors to site will be accompanied and a safe area will be provided for visiting drivers during loading and unloading.<br>▪ Speed limits signage will be used to control speeds on the access route and within the construction site.<br>▪ Construction vehicles and machinery will be maintained in good condition by a competent person as per the manufacturer's instructions. A dedicated area for maintenance work will be provided within the construction site area.<br>▪ All operators will wear personal protective equipment on-site and seat belts, where fitted by the manufacturer, will be worn when operating equipment.<br><br>**Sustainable Transport Measures**<br>To encourage bicycle usage, the development includes 124 no. bicycle parking spaces, provided as internal bike storage areas in each of the 3 apartments Blocks E, F and G, covered bike storage for the 4 duplex blocks, and additional bike storage at the crèche.<br><br>The proposed development includes pedestrian access to the existing footpaths along Old Whitechurch Rd. and on Kilbarry Enterprise Centre |

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| | Rd leading to Upper Dublin Hill granting access to the wider footpath network and bus service.<br><br>The development includes the creation of formalised walking paths to replace the informal walking paths located to the north of the site. The provision of these formal paths should encourage residents to exercise locally, removing the desire to travel via less sustainable modes of transport to other exercise destinations. |
| **Air Quality and Climate** | **Mitigation and Monitoring During Construction**<br>**Demolition/Construction Phase**<br>In order to ensure that dust nuisance does not occur, a series of preventative measures and a dust management plan will be formulated for the demolition and construction phase of the project. The proposed measures to be implemented during the demolition / construction stage include:<br><br>• Qualitative monitoring surveys – inspections for visible dust emissions in the vicinity of the site boundary (internal and external) should be conducted daily, results be recorded in a clear manner;<br>• Hard surface roads are to be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic;<br>• Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions;<br>• Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be <15kph, and on hard surfaced roads as site management dictates;<br>• Control site traffic: vehicles delivering or removing material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;<br>• Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary;<br>• Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;<br>• Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;<br>• Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for nuisance dust emissions exist; |

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| | • Scaffolding, where required, will be erect around the site where necessary during construction along with hoardings/mesh at ground level;<br>• At all times, these procedures will be strictly monitored and assessed by a designated site manager;<br>• In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations;<br>• All environmentally significant raw materials (fuels, etc.) are to be stored in certified containers and tanks which are fully secured with a 'no open lid policy' in place for materials in storage. This prevents fugitive emissions and will minimise losses from the installation;<br>• Effective training programmes are to be implemented for construction personnel for the duration of the construction programme;<br>• All vehicles will be turned off when not in use;<br>• Works will be restricted to the times as outlined in the permission;<br>• A strategy for ensuring effective communication with authorities and stakeholders will be implemented;<br><br>Construction vehicles, generators etc., may give rise to some $CO_2$ and $N_2O$ emissions. However, due to the short-term and temporary nature of these works the impact on climate change will not be significant and would not require any mitigation measures.<br><br>Full details of the procedures can be found in the Construction Environmental Management Plan.<br><br>**Mitigation and Monitoring During Operation**<br>Given the proposed use for this development, there are no direct sources of dust or other emissions that could give rise to nuisance or contravene any air quality standards. |
| **Noise and Vibration** | **Mitigation during Construction**<br>The scheme contractor will be obliged to give due regard to BS5228, which offers detailed guidance on the control of noise from construction activities. In particular, it is proposed that various practices be adopted during construction, including:<br><br>• limiting the hours during which site activities likely to create high levels of noise are permitted;<br>• establishing channels of communication between the contractor / developer, local authority and residents; |

- appointing a site representative responsible for matters relating to noise;
- ensuring all site access roads are kept as even as possible so as to mitigate the potential for vibration from lorries;
- monitoring typical levels of noise during critical periods and at sensitive locations (at representative locations along the perimeter of the development only).

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed, including:

- selection of plant with low inherent potential for generation of noise;
- siting of noisy plant as far away from sensitive properties as permitted by site constraints.
- provision of 2m high hoarding to block line of sight with adjacent dwellings located along the perimeter of the development.

Vibration from construction activities will be limited to the values set out in Table 9.10 (on the following page) but will likely be far below these values. It should be noted that these limits are not absolute but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Where there is existing damage, these limits may need to be reduced by up to 50%.

| **Allowable vibration (in terms of peak particle velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of:** | | |
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| Less than 10Hz | 10 to 50Hz | 50 to 100Hz (and above) |
| 3 mm/s | 3 to 8 mm/s | 8 to 10 mm/s |

Table 9.10 Allowable Vibration During Construction Phase

Note that no noise or vibration monitoring would be required in this instance given the relative distance of the primary construction areas from the nearest noise sensitive receptors.

**Mitigation During Operation**

**Activity Noise from the Creche**

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| | The noise impact assessment outlined in the previous section has confirmed that a noise barrier wall and supplemental tree planting will be required for provision along the western boundary line.<br><br>The noise barrier wall shall have the following specifications:<br><br>• Provided along the full extent of the creche's western boundary with the Old Whitechurch Road residential properties<br>• A minimum height of 2m<br>• Imperforate (i.e. no holes or gaps in the wall)<br>• Constructed from a material having a minimum surface mass of 10 kg/$m^2$.<br><br>The supplemental tree planting shall be as densely as possible along the full extent of the creche's western boundary with the Old Whitechurch Road residential properties (inside and along the noise barrier wall).<br><br>**Car Park Activity Noise**<br>The noise impact assessment outlined in the previous section has demonstrated that noise mitigation measures will not be required.<br>**Traffic on New Internal Roads**<br>The noise impact assessment outlined in the previous section has demonstrated that noise mitigation measures will not be required.<br><br>**Additional Vehicular Traffic on Public Roads**<br>The noise impact assessment outlined in the previous section has demonstrated that the expected increase in noise levels on most of the surrounding road networks will be imperceptible and therefore negligible.<br><br>There is expected to be a 5dB increase and therefore a slight noise impact on residential dwellings located along Old Whitechurch Road (particularly to the south of the proposed development). However, noise emissions from the road are not expected to exceed NRA minimum threshold criteria for noise emissions from roadways and there are no supplemental mitigation measures that could be practicably provided in this instance.<br><br>Given these prevailing conditions, no additional mitigation measures would therefore be deemed as being required. |
| **Biodiversity** | **Construction Phase** |

The recommendations outlined in the following sections aim to ensure that all potential negative impacts associated with the project are avoided or minimised to an insignificant level.

**Ecological Clerk of Works**

An Ecological Clerk of Works (ECoW) as well as a Project Landscape Architect will be appointed prior to the commencement of construction. The ECoW will be an ecologist with experience of baseline ecological surveys, pre-construction surveys and construction phase supervision. The ECoW will be responsible for completing pre-construction surveys and supervising construction works and advising on the implementation of biodiversity enhancement measures that will be commenced during the construction phase.

Pre-construction surveys required in advance of the construction phase will include as a minimum:

- Otter surveys along the Glenamought River – surveys to be completed a minimum distance 150m upstream and downstream of the proposed confluence point of the new constructed stream and the Glenamought River.
- Bat surveys of the structures occurring within the proposed development footprint that are to be demolished; and
- Marsh fritillary suitable habitat surveys and mapping of the abundance of Succisa pratensis within the landholding.

The ECoW will ensure that best practice construction methods and mitigation measures detailed in this EIAR and accompanying planning documentation including the Construction Environmental Management Plan (CEMP) and Natura Impact Statement are implemented in full.

The ECoW will be responsible for ensuring that the construction phase contractor is aware of key biodiversity receptors, such as marsh fritillary habitat, the Glenamought River and associated protected fauna including river lamprey, brown trout and otters; breeding bird species and particularly red listed species such as yellowhammer. The ECoW will inspect the construction works throughout the construction phase and will pay particular attention to the implementation of all biodiversity related mitigation measures.

The ECoW will provide monitoring inspection reports during the construction phase and will also provide a close-out report following the completion of the contract construction works.

Where necessary the ECoW will liaise with relevant authorities such as Cork County Council, the IFI and the NPWS with respect to construction phase activities that relate to biodiversity.

As part of the ECoW terms of appointment, the ECoW will be vested with the authority to stop works where activities have been identified on site that are not in accordance with the mitigation measures outlined in this EIAR, the Natura Impact Statement and/or the CEMP prepared for the planning application for the proposed development.

**Protected Species Licensing**

At the time of writing no requirement for protected species licences have been identified for biodiversity receptors that may require such licences to permit disturbance to breeding or resting sites. The ECoW will be required to complete pre-construction surveys in advance of the commencement of construction works and based upon the results of these surveys the ECoW will establish whether or not there is a need at that stage for protected species licences. An example of where such a need could arise is where an otter holt becomes established in the immediate vicinity of the proposed new constructed stream with the Glenamought River or in the even that the structures on site are being used as a bat roost.

**Measures to Minimise Impacts to Habitats**

Construction work will be confined strictly to within the direct land-take of the proposed development footprint. Only works relating to landscaping biodiversity habitat enhancement measures will be permitted to be completed outside the footprint of the proposed development footprint .

Construction machinery will be restricted to site roads and the footprint of the proposed development.

Habitats to be retained and enhanced on site will be identified to the contractor in advance of the commencement of construction works. These habitats will be marked out on site drawing that will identify them as Ecological Sensitive Zones (ESZs). The ESZs will comprise:

- Areas of dry acidic grassland identified as marsh fritillary suitable habitat (GC)'
- Area of woodland habitat to the retained and enhanced;
- Other areas of existing dry acidic grassland that will be treated as open meadow grassland for the operation phase.

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| | The ESZs will be fenced off prior to the commencement of construction works and no construction works, with the exception of works relating to the implementation of landscape and biodiversity habitat enhancement measures will be permitted to take place in these ESZs.<br><br>In addition to the above it is noted that the design of the project has ensured that direct impacts and disturbance to marsh fritillary suitable habitat (GC) will be avoided during the construction phase. This has been achieved by siting the main surface water underground attenuation tank for the scheme to the west of and outside the footprint of this habitat and the proposal to use horizontal directional drilling techniques to install an underground drain pipe northeast from the attenuation tank to the start of the new constructed stream. The use of horizontal directional drilling under the area of marsh fritillary suitable habitat (GC) eliminates the required for the excavation of a surface water trench and new surface channel within this habitat and thus avoids direct loss and disturbance to this habitat. It is noted that the horizontal directional drilling will be completed within the underlying bedrock below subsoil and soil levels and will not result in any changes to edaphic conditions supporting abundant swards of Succisa pratensis in this area.<br><br>**New Constructed Stream**<br>The proposed new constructed stream will be constructed in the following sequence to avoid/minimise the potential for disturbance to the Glenamought River and the potential for the loss of silt from the newly constructed channel to river.<br><br>The new constructed stream channel will be excavated to within 2m of the Glenamought River. The bankside at the Glenamought River will be retained and remain in place during the excavation of the new stream channel alignment. A temporary silt fence will be installed at the end of the excavated constructed stream alignment at the "upstream" side of the remaining 2m retained bankside buffer. The silt fence will be installed in accordance with CIRIA guidelines.<br><br>The angle of connection of the new constructed stream channel to the Glenamought river will face downstream. This will contribute to maintaining current flow rates along the river.<br><br>The new constructed stream channel bed will be finished with a natural sand, stone and cobble bed. Larger boulders will be places along the channel to ensure that the finished bed material is retained in the channel and does not become washed away. Given that flows along |

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| | the new constructed channel will be retained to low rates, at greenfield runoff rates, the potential for bed material to become washed away will be low. The provision of meander sections along sloping ground will also limit the potential for washout of bed material. In order to further maintain the integrity of the natural bed material to be provided along the stream boulders will be placed along the channel to further retard flows and any potential for wash out of bed material.<br><br>The bank side will be consolidated with vegetation that will include native hydrophilous species, tolerant of drying out. It is noted that the new stream channel is likely to dry out during extended periods of dry weather when surface water runoff from the proposed development footprint is low or absent.<br><br>Once the bed is installed and the bankside is vegetated the new stream will be connected to the Glenamought through the removal of the final 2m section of bankside. Boulder rip-rap will be installed at the connection point to ensure that the confluence between the new constructed stream and the river is maintained. Once these steps are completed the silt fence installed along the new constructed stream channel will be removed.<br><br>The timing of works for the final connection of the new constructed stream to the Glenamought River will coincide with the open season for instream works.<br>A final method statement will be required to be prepared by the site contractor prior to the commencement of any works for the new stream channel and the connection to the Glenamought River. The method statement will be required to incorporate the above measures as part of the approach to the installation of the new stream channel.<br><br>The contractor will be required to liaise with Inland Fisheries Ireland (IFI) and the method statement of the new stream works will be provide to the IFI. The works will be implemented only where the IFI have indicated their satisfaction with the proposed approach to the works as set out in the method statement.<br><br>**Measures to Safeguard Water Quality**<br>The management of surface water during the construction phase will adhere to the recommendations of the CIRIA guides Control of Water Pollution from Construction Sites (2001) and Control of Water Pollution from Linear Construction Projects (2006) |

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| | During construction key requirements for control of chemical pollution risk will include:<br>• Storage – all equipment, materials and chemicals will be stored away from any watercourse. Chemical, fuel and oil stores will be sited on impervious bases and within a secured bund of 110% of the storage capacity, within the lay down area;<br>• The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall also be tested and demonstrated.<br>• All fuel oil fill areas will have an appropriate spill apron.<br>• Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, well away from any surface watercourse;<br>• Maintenance – maintenance to construction plant will not be permitted on site, unless vehicles have broken down necessitating maintenance at the point of breakdown. All necessary pollution prevention measures will be put in place prior to commencement of maintenance in this instance;<br>• Concrete - Wet concrete operations would not be carried out within watercourses or adjacent to watercourses. Runoff from wastewaters or contaminated storm water will be directed to drains installed as part of the surface water management plan;<br>• Mess, sanitation and welfare facilities will be required during construction and will be located at the construction compound. Foul effluent will make use of chemical facilities with periodic removal for offsite disposal.<br>• Silt fences will be used during construction works in the vicinity of the Glenamought River and will be installed in line with the measures for the proposed new constructed stream detailed above.<br><br>**Measures to Minimise Impacts to Breeding Birds**<br>Where possible vegetation to be cleared onsite will be completed outside the nesting bird season between March and August inclusive. Where it is not possible to time such works outside these months then a survey of hedgerow/treeline/grassland vegetation and habitats for the presence of nesting birds will required to be completed prior to the commencement of vegetation removal by an experienced ecologist. This will involve a detailed inspection of the vegetation to be removed for the presence of nest. Particular attention will be required to be given to establishing the presence of yellowhammer nest sites or nests |

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| | of other red or amber listed bird species. In the event that nests are identified in hedgerow/treeline/grassland vegetation their clearance/removal will be postponed until it is confirmed that the nest sites are no longer active or after the breeding bird season terminates. While the nest is active an appropriate exclusion zone will be implemented around the nest by the ECoW and the contractor will be advised of the exclusion zone. In the event that it is not possible to postpone such works, then they will only be allowed to proceed following consultation with the NPWS, and where required, upon receipt of a licence from the Department/NPWS permitting the destruction of the nests.<br><br>Noise mitigation measures will be implemented during the construction phase and these measures are detailed in Chapter 8 of this EIAR. The noise mitigation measures will be implemented with the aim of minimising noise levels throughout the construction phase. The implementation of these measures with also minimise the potential for noise disturbance to bird species, as well as other fauna occurring in the vicinity of the site.<br><br>**Measures to Minimise Impacts to Breeding Birds**<br>Wherever possible night time lighting will be avoided during the construction phase of the project and particularly so during the bat activity season between the months of mid-March to mid-October. Given that it is envisaged that working hours for the construction phase will be from 07:00 to 18:00 subject to any conditions set down by An Bord Pleanála/Cork City Council, it is unlikely that the construction phase night time lighting will be required during the bat activity season. Nevertheless in the event that lighting is required, mobile lighting standards will be positioned away from high value bat foraging habitat in the form of structured vegetation (i.e. woodland, hedgerows and/or treelines). The mobile lighting standards will comprise directional lighting that will prevent light spill to such habitats. Lighting accessories such as hoods, cowls and louvres will also be available and used as required to prevent light spill to such habitats.<br><br>**Measures to Avoid the Spread of Non-Native Invasive Species**<br>A non-native invasive species management plan has been prepared for the proposed development construction phase. All measures detailed in this plan will be implemented in full.<br><br>**Operation Phase**<br><br>**Measures to Protect, Maintain & Enhance Marsh Fritillary Habitat** |

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| | The area of currently identified marsh fritillary suitable habitat (GC) occurring within the landholding will be subject to specific landscape and habitat management measures during the operation phase.<br><br>A boundary will be placed around this habitat in the form of a protective boundary that will deter recreational walking, dog walking and other recreational activities within this area. Information will be provided for residents of the proposed development and surrounding area highlighting the sensitivity of the habitat the need for sensitive land management of the habitat.<br><br>The area to be enclosed within the boundary amount to approximately 9,400m$^2$. This area will be managed for marsh fritillary and the successful management of this area as a suitable marsh fritillary habitat will result in an increase of approximately 2,900m$^2$ of area of suitable marsh fritillary habitat within the landholding.<br><br>In addition to this areas other areas of unenclosed meadow that will be treated as short sward meadow will also be managed to promote suitable habitat conditions for supporting colonies of marsh fritillary.<br><br>These areas will be managed to maximise its potential to function as suitable habitat for marsh fritillary. The abundance of marsh fritillary will be maintained in the existing c. 6,500m$^2$ of suitable marsh fritillary habitat within the enclosed area and the colonisation of remaining areas within the enclosed meadow area by Succisa pratensis will be promoted. The areas of short sward open meadow elsewhere will be managed to promote the growth of abundant Succisa pratensis in the sward. Both areas will be seeded with Succisa pratensis, with seed being collected from the existing stands of Succisa pratensis occurring within the landholding. An experienced botanist/horticulturalist will be engaged to collect and seed these areas with Succisa pratensis. The seeding will be completed during the latter stages of the construction phase and will form part of the construction phase contract and associated landscape works. Other vascular plants that will form part of the sward mix will include adult food plants comprising Cardamine pratensis, Ranunculus repens, Ranunculus acris, Centaurea nigra, Cirsium species, Taraxacum officinalis agg. and Hieracium/Hypochoeris species.<br><br>During the operation phase abundant Succisa pratensis will be maintained in the enclosed meadow area and the area of open meadow treated as a short sward. Sward heights will be maintained at less than 25cm in height as a patchwork of short sward at circa 10cm |

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| | and higher sward to 25cm. An indication suitable habitat with a mosaic of tall and short sward vegetation between 10cm and 25cm in height is shown on Figure 14.6 below.<br><br>Livestock grazing is recognised as the best method for the ongoing management of marsh fritillary colonies, with Phelan et al. (2021) noting that extensive grazing is the only long-term option for maintaining good quality habitat suitable marsh fritillary. Elsewhere rotational mowing has been identified as an appropriate management practice for conserving marsh fritillary habitat (INCC, 2018; Bubova et al., 2015; Van Swaay et al. 2012; Schtickzelle et al., 2005). Given the location of the enclosed meadow area and the open meadow areas to be treated with short sward in the immediate vicinity of the proposed development it will not be practical to maintain these areas in suitable habitat condition via livestock grazing methods. As such a rotational mowing regime will be required to be implemented. Rotational mowing involves successive mowing of different meadow fragments, with each single fragment being mown no more than once per year and the mowing of different fragments at different times in order to ensure heterogeneous sward height within meadows. On this basis rotational mowing will be undertaken once a year within any single fragment of the enclose meadow area and open short sward meadow area being mowed in any one year. The maximum area that can be mown within both areas at any one time will be one-third of the enclosed and open short sward meadows. Rotational mowing will be completed to leave a mosaic of small compartments that are not mown. All cuttings will be removed from the habitat areas during mowing. Mowing will be completed in mid to late June and late September.<br><br>The enclose meadow area and the open short sward meadow area will be monitored during the operation phase for marsh fritillary habitat suitability and the presence of marsh fritillary larvae.<br><br>Suitable under-grazed (SU) habitat for marsh fritillary also occurring within the wet grassland habitat occurring at the northern end of the landholding adjacent to the Glenamought River. This area of the landholding is likely to have been subject to undergrazing in recent times following the removal of livestock from the landholding. As part of the overall management of marsh fritillary habitat within the landholding this area will also be subject to the rotational mowing regime for marsh fritillary conservation as outlined above. |

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| | Both habitat suitability surveys and larvae surveys will be completed throughout the operation phase during years 1 to 5 of operation, year 7 and again during year 10. The monitoring regime will be reviewed during year 10. Site management will be required to liaise with the Planning Authority and the NPWS during the review of the monitoring regime at year 10 so that future ongoing monitoring is agreed between site management, the Planning Authority and the NPWS.<br><br>The primary marsh fritillary habitat management target will be the maintenance of suitable marsh fritillary habitat in Good Condition (GC) as defined in Section 14.1.3 of this Chapter within the enclosed meadow area and the open short sward meadow area. The presence of marsh fritillary larvae and proof of breeding within the enclosed meadow area and the open short sward meadow area will be a target of the marsh fritillary habitat management measures to be implemented within the landholding.<br><br>**Measures to Mitigate Impacts for Yellowhammer**<br>In order to compensate for the loss of a small area of potentially suitable foraging habitat associated with the area of semi-improved grassland with the proposed development footprint, area of open long sward meadow will be managed to promote suitable foraging habitat for yellowhammer. This will be achieved by incorporating cereal grain species as part of the species mix of areas of the landholding to be treated as open long sward meadow. The provision of such species within this habitat will minimise the loss of suitable yellowhammer foraging habitat to the footprint of the proposed development.<br><br>**Measures to Enhance Woodland Habitat**<br>The woodland to be retained and planted on site will be managed throughout the operation phase. The aim of the operation phase woodland management will be to establish a native woodland within the site. The key objectives of for the operation phase woodland management:<br><br>• The management of the woodland will be overseen by professionals (forester/arborist/landscaper/ecologist) with experience in managing native woodlands. A professional will be engaged throughout the operation phase of the project to supervise the management of the woodland habitats on site.<br>• In areas of retained woodland the woodland will be rotated on a continuous basis to increase the percentage of native broad-leaved tree species canopy cover and decrease the percentage of scrub cover. A key aim of the woodland |

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| | management will be to replace species-poor dense thicket of Ulex europeaus and Prunus spinosa with a more diverse range of native woodland species.<br>• Mature trees taller trees will be retained within the woodland.<br>• The native species to be used will be Quercus robur, Ilex aquifolium, Crataegus mongyna, Betula pubescens, Sorbus aucuparia and Prunus spinosa will be form the species mix for trees within the woodland. Planting of Fraxinus excelsior is not appropriate at this time due to the threat of ash dieback disease. The use of Fraxinus excelsior will be revisited during the operation phase of the project and where future conditions allow, this species will form part of the species mix to be planted when rotating sycamore trees.<br>• The rotation of mature trees will be undertaken throughout the operation phase and will be completed while still maintaining woodland cover within the retained woodland areas.<br>• Retain cut wood logs as stash piles on the woodland floor to provide habitat variation and decomposition matter for the woodland.<br>• Enhance habitat for fauna along woodland edges, particularly invertebrates including butterfly species. This will be achieved through the provision of scalloped edges to woodland habitat that increases shelter conditions for invertebrate as well as other fauna.<br>• Provide wildlife enhancement within the woodland during the operation phase. Enhancement measures that will be implemented during the operation phase will include the provision of bat boxes (a minimum of 3 will be provided within the project site throughout the operation phase) and bird boxes (a minimum of 3 will be provided throughout the operation phase)<br><br>**Measures to Mitigate Impacts for Bats**<br>The lighting design in the vicinity of habitat features that offer suitable foraging bats, such as woodland habitats to the north of the proposed development that are to be retained and enhanced will be provided as part of the project landscaping, The lighting for the proposed development has been prepared in line with best practice measures for minimising the impacts of artificial lighting to bats, as detailed in the Institute of Public Lighting 2018 guidance document Bats and Artificial Lighting in the UK. This lighting plan aims to limit lighting and light spill on to these habitats to ensure that optimum foraging conditions, that include unlit and low artificial light over the woodland and |

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| | meadow grassland habitats that provide suitable habitat for bats such as Common pipistrelle and Leisler's bat.<br><br>The retention of woodland habitat within the landholding along the north of the site connecting the western and eastern extent of the landholding and along the eastern boundary connecting the south side of the landholding north to the Glenamought River will ensure that connectivity in the landscape from west to east and north to south is retained and fragmentation of the wider landscape is avoided.<br><br>**Measures to Manage Surface Water Runoff**<br>A surface water management design has been prepared for the proposed development and will be implemented for the operation phase. The network has been designed in accordance with the GDSDS and incorporates onsite attenuation, full hydrocarbon and silt interceptors, hydrobrakes and the discharge of surface water from the proposed development at green field runoff rates. Nature-based solutions, such as SuDS have also been incorporated into the design of the project and will further provide for the effective management of surface water runoff generated at the project site during the operation phase. As part of the nature-based solutions a new constructed stream will be provided to convey flows from the western attenuation tank and horizontal directional drilled pipe to the Glenamought River. The new constructed stream channel will provide habitat heterogeneity within the woodland areas to the north of the landholding and has the potential to provide additional habitat for foraging habitat for invertebrates, bird and bat species. Conceptual examples of the new constructed stream are shown on Figure 14.7 below. |
| **Archaeology and Cultural Heritage** | **Construction Phase**<br>Given the scale and extent of the proposed development within a green field location, a programme of archaeological test trenching, under licence by the National Monuments Service, will be carried within the undisturbed areas of the proposed development site in advance of the construction phase. In the event that any sub-surface archaeological deposits, features or artefacts are identified during these site investigations, their locations will be recorded and securely cordoned off while the National Monuments Service are notified of the discovery and consulted to determine further mitigation measures, which may entail preservation in situ by avoidance or preservation by record through a systematic archaeological excavation. A detailed building survey of the farm buildings within the proposed development site will be compiled in written and photographic formats in advance of the construction phase. |

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| | There are a number of obligatory processes to be undertaken as part of applications to the National Monuments Service for licences to carry out archaeological test trench excavations and these will allow for monitoring of the successful implementation of mitigation measures. A detailed method statement stating the proposed strategy for the site investigations will accompany the submitted licence application which will clearly detail the extent of the archaeological works and outline the processes to be enacted in the event that any archaeological features are encountered. Reports on the archaeological site investigations will then be submitted to the National Monuments Service, the National Museum of Ireland and the Planning Authority which will clearly describe the results of all archaeological works in written, mapped and photographic formats. A copy of the building survey of the derelict farm buildings within the proposed development site will be submitted to Cork City Council.<br><br>**Operational Phase**<br>All required mitigation measures will be enacted prior to and during the construction phase and, therefore, no cultural heritage mitigation measures during the operational phase of the proposed development are predicted. |
| **Landscape & Visual Impact** | As with all development and in particular the development of greenfield sites, impacts are inevitable. From the outset of the design process mitigation has been considered in order to minimise the potential negative impact the proposed development may have on the Kilbarry environs and in particular impacts from the selected viewpoint locations.<br><br>Impact on the existing dwellings backing on to the western boundary is mitigated with the location of a Creche on that boundary with no overlooking from first floor level. Appropriate noise abatement fencing, and landscaping will be in place. The remaining rear gardens will back onto landscaped open space along the west side of the proposed new road linking the Old Whitechurch Road with the Upper Dublin Hill Road, which will ensure the protection of the existing trees in this area.<br><br>Mitigation will be in place along the southern boundary of the site bounding with the Kilbarry Business Park in the form of an avenue of trees that will augment and infill gaps in the boundary landscaping already in place within the Park. This will in time improve the view from southern areas of the city helping to provide a deeper vegetative |

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| | backdrop for the existing commercial structures on the hillside location.<br><br>The development will by overlooking Delaney's GAA Club improve the sense of security for its users. The link Road passing south of Delaney's will make the premises more accessible and safer for pedestrian and cyclists and public transport as well as private vehicles. The road link will make the Club Grounds less isolated than at present and give it a more public entrance point and will integrate the facilities better into the surrounding area.<br><br>The development on the northside of the plateau is designed to present a continuous frontage looking north out towards the valley and onwards over the metropolitan greenbelt beyond. In so doing the edge of the city at this location is well designed and defined. The development is fully exposed along this edge and the mass and scale of the new neighbourhood is broken down into three distinct character areas. The apartment buildings are designed as a focal point in the landscape. The scale and position of the apartment structures is designed to mitigate for the lack of passive surveillance over the zoned open space area below the residential area; smaller scale less obtrusive structures if put in place along this edge would not provide any passive surveillance to the meadows and trails proposed to circulate through and around the park area proposed below.<br>Of less scale the road frontage to the Old Whitechurch Road gives a good entrance to the development and a good urban frontage to the Old Whitechurch Road. The development is setback from the existing and proposed new link road edges to mitigate for the impact on existing dwellings presenting variously a side elevation and front elevations toward the new development.<br><br>Impact on bio-diversity is mitigated with the retention of as much existing vegetation as possible in particular in the area zoned as public open space. Existing fragile pollinator meadow habitats are to be enclosed with fencing and defensive hedging with appropriate management and maintenance procedures to be adopted. Further meadow areas are to be retained and enriched to extend the habitat value within the park. The wet meadow on the river's edge will be retained as existing without formal path routes proposed to access this area. The existing scrub woodland and significant trees will be where ever possible retained. Bicycle and pedestrian trails are proposed to enable access through and around the park area to the public for recreational use in a managed way minimising impact on the existing habitats. |

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| | Rainfall runoff is proposed to be attenuated appropriately and a dry cobble stream route will be constructed from the pipe outfall through the woodland scrub and wet meadow to the existing river Glenamought below the development to minimise impact on trees and habitat. |
| **Land and Soils** | **Mitigation during Construction**<br>The recommended mitigation measures are based on the ground investigations carried out to date and are used to inform the geotechnical design for the site.<br><br>**Geology – Construction Stage**<br>**Overburden Removal**<br>Subsoils and bedrock removal is an unavoidable consequence of the construction works. The earthworks balance (refer Tables per Section) has been designed to maximise the reusability of excavated materials within the site.<br>The presence of, and removal of, soil and fill material that have been identified as containing construction and demolition waste has been assessed. Whilst evidence provided by soil analysis to date indicates fill material is largely uncontaminated, this is based on 5no samples across the footprint of the site. Where it is contemplated that a significant volume of soil/fill material will require excavation and transfer from the site, additional sampling and analysis shall be required over the course of development works.<br><br>1. Where there is any doubt on material based on observations during excavations, additional testing should be undertaken.<br>2. Notwithstanding the findings of the Verde report (Appendix 13.1), it remains the responsibility of the groundwork Contractor to ensure that material is appropriately managed during the development. In particular, the Contractor will be responsible for the appropriate segregation of excavated materials. The Contractor should retain a competent person to manage and supervise soil excavation and removal from the site. This person should ensure correct procedures are followed and that waste soils are appropriately logged and tracked using appropriate docketing system.<br>3. The appointed contractor for future groundworks will be expected to retain the services of an experienced environmental engineer or scientist during bulk excavation works, primarily to identify the depth of made ground and to identify any previously unidentified hotspots. |

4. It is recommended that a Soil and Material Management Plan (SMMP) is produced by the appointed Contractor, to detail procedures to manage the excavation and removal of soil during construction works.
5. In recognition of national policy and sustainability, where material cannot be re-used as part of the on-site development works and requires transfer from the site, consideration should be given to the transfer of this material as a by-product under Article 27.

Where surplus soil cannot be reused it will be placed in the disposal areas set out in Chapter 15 Resource and Waste Management or removed off site for treatment, recycling, or disposal at an authorised waste management facility off site in accordance with the additional sampling and analysis required above.

**Economic Geology**

No mitigation measures are proposed

**Erosion of soils**

Topsoil stripping and earthworks removal will not be carried out over large areas in advance, which will limit the time for which these areas are exposed. Similarly, when the design cut level has been achieved, the slopes shall be battered back to a safe angle of repose and topsoiled immediately, the underlying material shall be protected by covering with construction materials or topsoil, as required, and shall not be left exposed. Control measures will involve the immediate use of topsoil wherever practicable after its stripping.

Following the implementation of these mitigation measures the residual impact is predicted to be imperceptible and neutral (EPA, 2022).

**Sealing of topsoil/overburden material**

The principal avoidance measures shall include the following; topsoil and overburden shall not be unnecessarily trafficked either before stripping or when in a stockpile. When the design cut level has been achieved, the underlying overburden shall be covered with construction materials or topsoil, as required, and shall not be left exposed.

Following the implementation of these mitigation measures the residual impact is predicted to be neutral Imperceptible.

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| | **Mitigation during Operation**<br>**Soil Pollution**<br>Mitigation measures proposed for soil pollution are consistent with the mitigation measures outlined in Chapter 14 Water for the protection of groundwater, as potential contaminants could travel through soil before entering the groundwater system. As such, measures to protect the groundwater also protect the soils from contamination. |
| **Water & Hydrology** | **Construction Mitigation Measures**<br>The main potential impacts are associated with the Construction Phase of the proposed development. The mitigation measures in relation to the achievement of a high quality of surface water runoff from the development and groundwater protection will ensure that the status of both surface water and groundwater bodies in the vicinity of the site will be at least maintained (see WFD water body status and objectives) regardless of their existing status. The following Best Practice Guidance relating to water control will be adhered to at all stages of construction. CIRIA (Construction Industry Research and Information Association) 2006: Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006) and CIRIA 2006: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2006.<br><br>The following mitigation measures will be put in place to minimise and mitigate the potential impacts to the ground and surface water at the site:<br><br>• Excavated soils and rock will be temporarily stockpiled and stored away from any ditch or surface water drainage network to prevent any suspended solids from entering same.<br>• Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement areas, where measures will be implemented to capture and treat sediment- laden runoff prior to discharge of surface water at a controlled rate.<br>• Silt-fences will be installed at upper sides of the existing vegetated areas to the north of the development area to protect the existing watercourse from unintended silt runoff.<br>• Protection measures will be put in place to ensure that all materials used during the construction phase are appropriately handled, stored, and disposed of in accordance with recognized standards and manufacturer's guidance. Hazardous construction materials shall be stored |

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| | appropriately to prevent contamination of watercourses or groundwater.<br>• Designated impermeable fuelling areas will be constructed. Fuels, oils, solvents, and other chemicals used during construction will be stored within temporary bunded storage in designated areas of the site. Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996 (as amended).<br>• Refuelling of construction vehicles and hydraulic oils or lubricants to vehicles will take place off-site or in designated hardstanding areas away from surface water drainage in order to minimise the potential contamination of the water environment. Spill kits and drip trays will be kept in the designated areas in the events of spillage during refuelling of the construction vehicles and machineries. All relevant personnel will be fully trained in the use of this equipment. Attention and care to be taken during the refuelling and maintenance operation.<br>• All concrete batching and mixing activities will be located in areas away from watercourses and drains.<br>• Concrete batching and concrete wash down or wash out of concrete trucks will take place off site or in a designated area with an impermeable surface and appropriate drainage/interception/collection measures in place. Spills of concrete, cement, grout, or similar materials will not be hosed into drains.<br>• Discharge from any vehicle wheel wash areas is to be directed to onsite settlement areas, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.<br>• Regular inspection of surface water run-off and any sediment control measures e.g. silt traps will be carried out during the Construction Phase.<br>• Regular auditing of construction/mitigation measures will be undertaken e.g. concrete pouring, refuelling in designated areas etc.<br><br>**Operational Mitigation Measures**<br>The developed site will be predominantly covered in hardstanding. The impermeable surface will minimise the potential influx of any contaminants into soils and underlying groundwater. |

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| | Surface water runoff arising on site during the operational phase will be directed to the surface water drainage system and then via an appropriately designed system such as petrol or hydrocarbon interceptor and silt traps that remove the contaminants from runoff prior to discharge to the final outfall point.<br>Any accidental leak from drainage to car parks or road areas will be discharged through appropriate oil interceptor to the drainage system.<br><br>A regular maintenance and inspection programme of the flow control devices, attenuation storage facilities, SuDS measures, gullies and petrol interceptors will be required during the Operational Phase to ensure the proper working of the development's networks and discharges.<br><br>Attenuation and nature-based SuDS measures will be provided to ensure that the discharge rate is maintained at greenfield runoff rate. The attenuation facility and SuDS features will accommodate rainfall events up to, and including, the 1-in-100-year storm event with a 10% allowance for further flow increases due to climate change. Surface water runoff from the site will be managed and attenuated to the greenfield runoff rate as recommended in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by SuDS features and Hydro-brake flow control devices, with ground level nature-based features such as swales and tree-pits and underground attenuation tanks, provided to store runoff from a 1 in 100-year return period event.<br><br>Due to the various measures including the attenuation systems with hydrocarbon interception and the design of the wider drainage system in line with SuDS, the likelihood of any spills entering the water environment is negligible.<br><br>No future surface water monitoring is proposed as part of the proposed project due to the low hazard potential at the development.<br><br>Oil interceptor(s) will be maintained and cleaned out in accordance with the manufacturer's instructions.<br><br>Maintenance of the surface water and foul sewer drainage systems as per normal urban developments is recommended to minimise any accidental discharges to ground.<br><br>The performance of all SuDS features will be monitored by the relevant authorities during the life of the development. |

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| | Monitoring of the installed hydro brake, interceptors and gullies will be required to prevent contamination and increased runoff from the site. |
| **Resources and Waste Management** | **Mitigation During Construction**<br>The following mitigation measures will be implemented during the construction phase of the Proposed Development:<br><br>A Construction and Demolition Resource and Waste Management Plan (C&D RWMP) will be prepared, and this will be implemented by the appointed contractor in line with the *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects (EPA 2021a)*.<br><br>The C&D RWMP outlines how waste arising during the demolition and construction phases of the proposed development will be managed in a way that ensures compliance with the provisions of the Waste Management Acts, 1996, as amended. The appointed contractor will update the C&D RWMP in advance of construction commencement.<br><br>Adherence to the high-level strategy presented in this C&D RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and construction phases of the Proposed Development.<br><br>A quantity of soil, stone, gravel, clay and rock will need to be excavated to facilitate the proposed development. It is estimated that 35,544 $m^3$ of excavated material will be reused on the site as structural/ non-structural fill and for landscaping. Approximately 18,071 $m^3$ of material will need to be removed off-site as there will be a surplus of material after excavation.<br><br>In addition, the following mitigation measures will be implemented:<br><br>• Building materials will be chosen with an aim to 'design out waste'.<br>• On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:<br>• Concrete rubble (including ceramics, tiles and bricks)<br>• Plasterboard<br>• Metals |

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| | • Glass<br>• Timber<br>• 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;<br>• All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;<br>• 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);<br>• A Waste Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition, excavation and construction works;<br>• All construction staff will be provided with training regarding the waste management procedures;<br>• All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;<br>• All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and<br>• All waste leaving the site will be recorded and copies of relevant documentation maintained.<br><br>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 Article 27 of the *EC (Waste Directive) Regulations (2011)*. EPA approval will be obtained prior to moving material as a by-product.<br><br>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*, and the *Southern Region Waste Management Plan 2015 – 2021*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.<br><br>**Mitigation During Operation**<br>Maintenance operations will be undertaken under the jurisdiction of the local authority and in accordance with their waste management plans. All recyclable materials will be segregated at source to reduce |

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| | waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the *Southern Region Waste Management Plan 2015 – 2020* and *Cork City Council (Segregation, Storage, and Presentation of Household and Commercial Waste) Byelaws, 2019*.<br><br>In addition, the following mitigation measures will be implemented:<br><br>The residents will be encouraged to ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):<br>• Organic waste<br>• Dry mix Recyclables<br>• Mixed non-recyclable waste<br>• Glass<br>• Waste electrical and electronic equipment (WEEE)<br>• Batteries (non-hazardous and hazardous)<br>• Cooking oil<br>• Light bulbs<br>• Cleaning chemicals (pesticides, paints, adhesive, resins, detergents, etc.)<br>• Furniture (and from time-to-time other bulky waste) and<br>• Abandoned bicycles<br><br>The development will be taken in charge by the Local Authority or will be managed by a Management Company or by a combination of both such that residents will be provided with colour coded bins or other suitable receptacles to assist with segregation of wastes.<br><br>The Local Authority and Management Company will ensure that all waste collected from the site of the proposed development will be reused, recycled or recovered, where possible.<br><br>The Local Authority and Management Company will ensure that all waste leaving the site will be transported by suitable, permitted contractors and taken to suitably registered, permitted or licensed facilities.<br><br>Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be long term, imperceptible and neutral. |

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| **Population and Human Health** | **Construction Phase**<br>A site Construction and Environmental Management Plan (CEMP) will be prepared by the selected contractor prior to work commencing on site. The main purpose of a CEMP is to provide a mechanism for implementation of the various mitigation measures which are described in this EIAR and contained within the Construction and Environmental Management Plan that accompanies this application under separate cover.<br><br>All personnel will be required to understand and implement the requirements of the CDEMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.<br><br>Project supervisors for the construction phase will be appointed in accordance with the Health, Safety and Welfare at Work (Construction Regulations) 2013, and a Preliminary Health and Safety Plan will be formulated during the detailed design stage which will address health and safety issues from the design stages, through to the completion of the construction phases.<br><br>Adherence to the construction phase mitigation measures presented in this EIAR will ensure that the construction of the proposed development will have an imperceptible and neutral impact in terms of health and safety.<br><br>**Operational Phase**<br>The proposed development has been designed to avoid negative impacts on population and human health through;<br><br>• Incorporating extensive leisure and amenity facilities within the layout, including the provision of a large amenity park and extensive provision for walking and cycling throughout the development;<br>• Landscaping to mitigate against issues arising from microclimate conditions;<br>• The inclusion of a comprehensive foul and surface water management system;<br>• Energy efficient measures; and,<br>• High quality finishes and materials.<br><br>No significant risks to population and human health have been identified in relation to the operational phase of the development. Accordingly, no further mitigation measures are required. |

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| **Material Assets** | Mitigation measures proposed in relation to the drainage, water, power and telecommunications services infrastructure include the following:<br><br>• A "Construction and Environmental Management Plan" has been prepared and will be further developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the "Construction Management Plan".<br>• In order to reduce the risk of defective or leaking sewers, all new sewers will be laid in accordance with Irish Water standards, pressure-tested and CCTV surveyed to ascertain any possible defects before being brought into operation.<br>• The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be removed off site to a licensed facility until a connection to the public foul drainage network has been established.<br>• The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.<br>• The permanent connection to serve the development, will be carried out under an agreed methodology and with full notification to existing Irish Water customers who will be affected by the short-term interruptions to water supply which will occur while making these connections.<br>• Where possible, backup network supply to any services will be provided should the need for relocation or diversion or existing services be required. Otherwise, relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works.<br>• Connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.<br>• The storm sewer network is designed to flow under public roads and open spaces to ensure unimpeded access is available to the pipe network (including hydrocarbon interceptors and silt traps) at all times to allow for monitoring and maintenance.<br><br>With appropriate mitigation measures in place, no significant negative impacts on material assets are predicted as a consequence of the construction phase of the development. |

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| | **Operational Phase**<br>Mitigation measures proposed during the operational stage include the following:<br><br>All new drainage lines (foul and surface water) will be pressure-tested and will be subject to a CCTV survey to identify any possible defects prior to being made operational.<br><br>Regular maintenance of the drainage network including the petrol interceptor, flow control and surface water attenuation system will ensure that they are operating correctly.<br><br>It is envisaged that the development will take place and be occupied on a phased basis and therefore the downstream foul sewerage system (foul sewer network and wastewater treatment facility) will be loaded gradually and incrementally.<br><br>Water conservation methods such as the use of low flush toilets and low flow taps will be incorporated into dwellings to reduce water volumes and related treatment and abstraction costs of the development. Such water conservation methods will reduce the loading on the foul sewer network and the treatment works at Carrigrennan WWTP.<br><br>On completion of the construction phase no further mitigation measures are proposed in relation to the electrical, gas and telecommunications infrastructure.<br><br>With mitigation measures in place, no significant negative impacts on material assets are predicted as a consequence of the operational phase of the development. |
| **Major Accidents and Disasters** | **Construction**<br>All potential risks, direct and indirect, identified during the construction phase were determined to be 'low risk scenarios'. A detailed CEMP will be prepared by the contractor and implemented throughout the works. The CEMP will be a live document and continuously updated to ensure that potential risks of major accidents and/or disasters are identified, avoided and mitigated as necessary.<br><br>**Operation**<br>The fire risk mitigation for the apartments and creche building will comprise all fire safety measures necessary to comply with the |

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| | requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2017. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2018 from Cork City Council/Cork City Fire Brigade.<br><br>The proposed development will be designed and built in line with best international current practices and as such mitigation against the risk of major accidents and/ or disasters will be embedded throughout the design stage. All potential risks, direct and indirect, identified during the operation phase were determined to be 'low risk scenarios'. |

**Table 20.1 Summary of Mitigation Measures**

## 20.3 Summary of Monitoring (Construction and Operation)

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| **Air Quality and Climate** | Mitigation and Monitoring Measures Overlap<br><br>**Demolition/Construction Phase**<br>In order to ensure that dust nuisance does not occur, a series of preventative measures and a dust management plan will be formulated for the demolition and construction phase of the project. The proposed measures to be implemented during the demolition / construction stage include:<br><br>• Qualitative monitoring surveys – inspections for visible dust emissions in the vicinity of the site boundary (internal and external) should be conducted daily, results be recorded in a clear manner;<br>• Hard surface roads are to be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic;<br>• Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions;<br>• Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be <15kph, and on hard surfaced roads as site management dictates;<br>• Control site traffic: vehicles delivering or removing material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;<br>• Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary;<br>• Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;<br>• Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;<br>• Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for nuisance dust emissions exist;<br>• Scaffolding, where required, will be erect around the site where necessary during construction along with hoardings/mesh at ground level;<br>• At all times, these procedures will be strictly monitored and assessed by a designated site manager;<br>• In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations; |

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| | • All environmentally significant raw materials (fuels, etc.) are to be stored in certified containers and tanks which are fully secured with a 'no open lid policy' in place for materials in storage. This prevents fugitive emissions and will minimise losses from the installation;<br>• Effective training programmes are to be implemented for construction personnel for the duration of the construction programme;<br>• All vehicles will be turned off when not in use;<br>• Works will be restricted to the times as outlined in the permission;<br>• A strategy for ensuring effective communication with authorities and stakeholders will be implemented;<br><br>Construction vehicles, generators etc., may give rise to some $CO_2$ and $N_2O$ emissions. However, due to the short-term and temporary nature of these works the impact on climate change will not be significant and would not require any mitigation measures.<br><br>Full details of the procedures can be found in the Construction Environmental Management Plan. |
| **Noise and Vibration** | **Construction Phase**<br>Note that no noise or vibration monitoring would be required in this instance given the relative distance of the primary construction areas from the nearest noise sensitive receptors. |
| **Biodiversity** | Mitigation and Monitoring Measures Overlap<br><br>**Construction Phase**<br>The recommendations outlined in the following sections aim to ensure that all potential negative impacts associated with the project are avoided or minimised to an insignificant level.<br><br>**Ecological Clerk of Works**<br>An Ecological Clerk of Works (ECoW) as well as a Project Landscape Architect will be appointed prior to the commencement of construction. The ECoW will be an ecologist with experience of baseline ecological surveys, pre-construction surveys and construction phase supervision. The ECoW will be responsible for completing pre-construction surveys and supervising construction works and advising on the implementation of biodiversity enhancement measures that will be commenced during the construction phase.<br>Pre-construction surveys required in advance of the construction phase will include as a minimum: |

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| | • Otter surveys along the Glenamought River – surveys to be completed a minimum distance 150m upstream and downstream of the proposed confluence point of the new constructed stream and the Glenamought River.<br>• Bat surveys of the structures occurring within the proposed development footprint that are to be demolished; and<br>• Marsh fritillary suitable habitat surveys and mapping of the abundance of Succisa pratensis within the landholding.<br><br>The ECoW will ensure that best practice construction methods and mitigation measures detailed in this EIAR and accompanying planning documentation including the Construction Environmental Management Plan (CEMP) and Natura Impact Statement are implemented in full.<br><br>The ECoW will be responsible for ensuring that the construction phase contractor is aware of key biodiversity receptors, such as marsh fritillary habitat, the Glenamought River and associated protected fauna including river lamprey, brown trout and otters; breeding bird species and particularly red listed species such as yellowhammer. The ECoW will inspect the construction works throughout the construction phase and will pay particular attention to the implementation of all biodiversity related mitigation measures.<br><br>The ECoW will provide monitoring inspection reports during the construction phase and will also provide a close-out report following the completion of the contract construction works.<br><br>Where necessary the ECoW will liaise with relevant authorities such as Cork County Council, the IFI and the NPWS with respect to construction phase activities that relate to biodiversity.<br><br>As part of the ECoW terms of appointment, the ECoW will be vested with the authority to stop works where activities have been identified on site that are not in accordance with the mitigation measures outlined in this EIAR, the Natura Impact Statement and/or the CEMP prepared for the planning application for the proposed development.<br><br>**Protected Species Licensing**<br>At the time of writing no requirement for protected species licences have been identified for biodiversity receptors that may require such licences to permit disturbance to breeding or resting sites. The ECoW will be required to complete pre-construction surveys in advance of the commencement of construction works and based upon the results of these surveys the ECoW will establish whether or not there is a need at that stage for |

protected species licences. An example of where such a need could arise is where an otter holt becomes established in the immediate vicinity of the proposed new constructed stream with the Glenamought River or in the even that the structures on site are being used as a bat roost.

**Measures to Minimise Impacts to Habitats**

Construction work will be confined strictly to within the direct land-take of the proposed development footprint. Only works relating to landscaping biodiversity habitat enhancement measures will be permitted to be completed outside the footprint of the proposed development footprint . Construction machinery will be restricted to site roads and the footprint of the proposed development.

Habitats to be retained and enhanced on site will be identified to the contractor in advance of the commencement of construction works. These habitats will be marked out on site drawing that will identify them as Ecological Sensitive Zones (ESZs). The ESZs will comprise:

- Areas of dry acidic grassland identified as marsh fritillary suitable habitat (GC)'
- Area of woodland habitat to the retained and enhanced;
- Other areas of existing dry acidic grassland that will be treated as open meadow grassland for the operation phase.

The ESZs will be fenced off prior to the commencement of construction works and no construction works, with the exception of works relating to the implementation of landscape and biodiversity habitat enhancement measures will be permitted to take place in these ESZs.

In addition to the above it is noted that the design of the project has ensured that direct impacts and disturbance to marsh fritillary suitable habitat (GC) will be avoided during the construction phase. This has been achieved by siting the main surface water underground attenuation tank for the scheme to the west of and outside the footprint of this habitat and the proposal to use horizontal directional drilling techniques to install an underground drain pipe northeast from the attenuation tank to the start of the new constructed stream. The use of horizontal directional drilling under the area of marsh fritillary suitable habitat (GC) eliminates the required for the excavation of a surface water trench and new surface channel within this habitat and thus avoids direct loss and disturbance to this habitat. It is noted that the horizontal directional drilling will be completed within the underlying bedrock below subsoil and soil levels and will not result in any changes to edaphic conditions supporting abundant swards of Succisa pratensis in this area.

**New Constructed Stream**

The proposed new constructed stream will be constructed in the following sequence to avoid/minimise the potential for disturbance to the Glenamought River and the potential for the loss of silt from the newly constructed channel to river.

The new constructed stream channel will be excavated to within 2m of the Glenamought River. The bankside at the Glenamought River will be retained and remain in place during the excavation of the new stream channel alignment. A temporary silt fence will be installed at the end of the excavated constructed stream alignment at the "upstream" side of the remaining 2m retained bankside buffer. The silt fence will be installed in accordance with CIRIA guidelines.

The angle of connection of the new constructed stream channel to the Glenamought river will face downstream. This will contribute to maintaining current flow rates along the river.

The new constructed stream channel bed will be finished with a natural sand, stone and cobble bed. Larger boulders will be places along the channel to ensure that the finished bed material is retained in the channel and does not become washed away. Given that flows along the new constructed channel will be retained to low rates, at greenfield runoff rates, the potential for bed material to become washed away will be low. The provision of meander sections along sloping ground will also limit the potential for washout of bed material. In order to further maintain the integrity of the natural bed material to be provided along the stream boulders will be placed along the channel to further retard flows and any potential for wash out of bed material.

The bank side will be consolidated with vegetation that will include native hydrophilous species, tolerant of drying out. It is noted that the new stream channel is likely to dry out during extended periods of dry weather when surface water runoff from the proposed development footprint is low or absent.

Once the bed is installed and the bankside is vegetated the new stream will be connected to the Glenamought through the removal of the final 2m section of bankside. Boulder rip-rap will be installed at the connection point to ensure that the confluence between the new constructed stream and the river is maintained. Once these steps are completed the silt fence installed along the new constructed stream channel will be removed.

The timing of works for the final connection of the new constructed stream to the Glenamought River will coincide with the open season for instream works.

A final method statement will be required to be prepared by the site contractor prior to the commencement of any works for the new stream channel and the connection to the Glenamought River. The method statement will be required to incorporate the above measures as part of the approach to the installation of the new stream channel.

The contractor will be required to liaise with Inland Fisheries Ireland (IFI) and the method statement of the new stream works will be provide to the IFI. The works will be implemented only where the IFI have indicated their satisfaction with the proposed approach to the works as set out in the method statement.

**Measures to Safeguard Water Quality**

The management of surface water during the construction phase will adhere to the recommendations of the CIRIA guides Control of Water Pollution from Construction Sites (2001) and Control of Water Pollution from Linear Construction Projects (2006)

During construction key requirements for control of chemical pollution risk will include:

- Storage – all equipment, materials and chemicals will be stored away from any watercourse. Chemical, fuel and oil stores will be sited on impervious bases and within a secured bund of 110% of the storage capacity, within the lay down area;
- The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall also be tested and demonstrated.
- All fuel oil fill areas will have an appropriate spill apron.
- Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, well away from any surface watercourse;
- Maintenance – maintenance to construction plant will not be permitted on site, unless vehicles have broken down necessitating maintenance at the point of breakdown. All necessary pollution prevention measures will be put in place prior to commencement of maintenance in this instance;
- Concrete - Wet concrete operations would not be carried out within watercourses or adjacent to watercourses. Runoff from

wastewaters or contaminated storm water will be directed to drains installed as part of the surface water management plan;

- Mess, sanitation and welfare facilities will be required during construction and will be located at the construction compound. Foul effluent will make use of chemical facilities with periodic removal for offsite disposal.
- Silt fences will be used during construction works in the vicinity of the Glenamought River and will be installed in line with the measures for the proposed new constructed stream detailed above.

**Measures to Minimise Impacts to Breeding Birds**

Where possible vegetation to be cleared onsite will be completed outside the nesting bird season between March and August inclusive. Where it is not possible to time such works outside these months then a survey of hedgerow/treeline/grassland vegetation and habitats for the presence of nesting birds will required to be completed prior to the commencement of vegetation removal by an experienced ecologist. This will involve a detailed inspection of the vegetation to be removed for the presence of nest. Particular attention will be required to be given to establishing the presence of yellowhammer nest sites or nests of other red or amber listed bird species. In the event that nests are identified in hedgerow/treeline/grassland vegetation their clearance/removal will be postponed until it is confirmed that the nest sites are no longer active or after the breeding bird season terminates. While the nest is active an appropriate exclusion zone will be implemented around the nest by the ECoW and the contractor will be advised of the exclusion zone. In the event that it is not possible to postpone such works, then they will only be allowed to proceed following consultation with the NPWS, and where required, upon receipt of a licence from the Department/NPWS permitting the destruction of the nests.

Noise mitigation measures will be implemented during the construction phase and these measures are detailed in Chapter 8 of this EIAR. The noise mitigation measures will be implemented with the aim of minimising noise levels throughout the construction phase. The implementation of these measures with also minimise the potential for noise disturbance to bird species, as well as other fauna occurring in the vicinity of the site.

**Measures to Minimise Impacts to Breeding Birds**

Wherever possible night time lighting will be avoided during the construction phase of the project and particularly so during the bat activity season between the months of mid-March to mid-October. Given that it is envisaged that working hours for the construction phase will be from 07:00

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| | to 18:00 subject to any conditions set down by An Bord Pleanála/Cork City Council, it is unlikely that the construction phase night time lighting will be required during the bat activity season. Nevertheless in the event that lighting is required, mobile lighting standards will be positioned away from high value bat foraging habitat in the form of structured vegetation (i.e. woodland, hedgerows and/or treelines). The mobile lighting standards will comprise directional lighting that will prevent light spill to such habitats. Lighting accessories such as hoods, cowls and louvres will also be available and used as required to prevent light spill to such habitats.<br><br>**Measures to Avoid the Spread of Non-Native Invasive Species**<br>A non-native invasive species management plan has been prepared for the proposed development construction phase. All measures detailed in this plan will be implemented in full.<br><br>**Operation Phase**<br><br>**Measures to Protect, Maintain & Enhance Marsh Fritillary Habitat**<br>The area of currently identified marsh fritillary suitable habitat (GC) occurring within the landholding will be subject to specific landscape and habitat management measures during the operation phase.<br><br>A boundary will be placed around this habitat in the form of a protective boundary that will deter recreational walking, dog walking and other recreational activities within this area. Information will be provided for residents of the proposed development and surrounding area highlighting the sensitivity of the habitat the need for sensitive land management of the habitat.<br><br>The area to be enclosed within the boundary amount to approximately 9,400m$^2$. This area will be managed for marsh fritillary and the successful management of this area as a suitable marsh fritillary habitat will result in an increase of approximately 2,900m$^2$ of area of suitable marsh fritillary habitat within the landholding.<br><br>In addition to this areas other areas of unenclosed meadow that will be treated as short sward meadow will also be managed to promote suitable habitat conditions for supporting colonies of marsh fritillary.<br><br>These areas will be managed to maximise its potential to function as suitable habitat for marsh fritillary. The abundance of marsh fritillary will be maintained in the existing c. 6,500m$^2$ of suitable marsh fritillary habitat within the enclosed area and the colonisation of remaining areas within the enclosed meadow area by Succisa pratensis will be promoted. The |

areas of short sward open meadow elsewhere will be managed to promote the growth of abundant Succisa pratensis in the sward. Both areas will be seeded with Succisa pratensis, with seed being collected from the existing stands of Succisa pratensis occurring within the landholding. An experienced botanist/horticulturalist will be engaged to collect and seed these areas with Succisa pratensis. The seeding will be completed during the latter stages of the construction phase and will form part of the construction phase contract and associated landscape works. Other vascular plants that will form part of the sward mix will include adult food plants comprising Cardamine pratensis, Ranunculus repens, Ranunculus acris, Centaurea nigra, Cirsium species, Taraxacum officinalis agg. and Hieracium/Hypochoeris species.

During the operation phase abundant Succisa pratensis will be maintained in the enclosed meadow area and the area of open meadow treated as a short sward. Sward heights will be maintained at less than 25cm in height as a patchwork of short sward at circa 10cm and higher sward to 25cm. An indication suitable habitat with a mosaic of tall and short sward vegetation between 10cm and 25cm in height is shown on Figure 14.6 below.

Livestock grazing is recognised as the best method for the ongoing management of marsh fritillary colonies, with Phelan et al. (2021) noting that extensive grazing is the only long-term option for maintaining good quality habitat suitable marsh fritillary. Elsewhere rotational mowing has been identified as an appropriate management practice for conserving marsh fritillary habitat (INCC, 2018; Bubova et al., 2015; Van Swaay et al. 2012; Schtickzelle et al., 2005). Given the location of the enclosed meadow area and the open meadow areas to be treated with short sward in the immediate vicinity of the proposed development it will not be practical to maintain these areas in suitable habitat condition via livestock grazing methods. As such a rotational mowing regime will be required to be implemented. Rotational mowing involves successive mowing of different meadow fragments, with each single fragment being mown no more than once per year and the mowing of different fragments at different times in order to ensure heterogeneous sward height within meadows. On this basis rotational mowing will be undertaken once a year within any single fragment of the enclose meadow area and open short sward meadow area being mowed in any one year. The maximum area that can be mown within both areas at any one time will be one-third of the enclosed and open short sward meadows. Rotational mowing will be completed to leave a mosaic of small compartments that are not mown. All cuttings will be removed from the habitat areas during mowing. Mowing will be completed in mid to late June and late September.

The enclose meadow area and the open short sward meadow area will be monitored during the operation phase for marsh fritillary habitat suitability and the presence of marsh fritillary larvae.

Suitable under-grazed (SU) habitat for marsh fritillary also occurring within the wet grassland habitat occurring at the northern end of the landholding adjacent to the Glenamought River. This area of the landholding is likely to have been subject to undergrazing in recent times following the removal of livestock from the landholding. As part of the overall management of marsh fritillary habitat within the landholding this area will also be subject to the rotational mowing regime for marsh fritillary conservation as outlined above.

Both habitat suitability surveys and larvae surveys will be completed throughout the operation phase during years 1 to 5 of operation, year 7 and again during year 10. The monitoring regime will be reviewed during year 10. Site management will be required to liaise with the Planning Authority and the NPWS during the review of the monitoring regime at year 10 so that future ongoing monitoring is agreed between site management, the Planning Authority and the NPWS.

The primary marsh fritillary habitat management target will be the maintenance of suitable marsh fritillary habitat in Good Condition (GC) as defined in Section 14.1.3 of this Chapter within the enclosed meadow area and the open short sward meadow area. The presence of marsh fritillary larvae and proof of breeding within the enclosed meadow area and the open short sward meadow area will be a target of the marsh fritillary habitat management measures to be implemented within the landholding.

**Measures to Mitigate Impacts for Yellowhammer**

In order to compensate for the loss of a small area of potentially suitable foraging habitat associated with the area of semi-improved grassland with the proposed development footprint, area of open long sward meadow will be managed to promote suitable foraging habitat for yellowhammer. This will be achieved by incorporating cereal grain species as part of the species mix of areas of the landholding to be treated as open long sward meadow. The provision of such species within this habitat will minimise the loss of suitable yellowhammer foraging habitat to the footprint of the proposed development.

**Measures to Enhance Woodland Habitat**

The woodland to be retained and planted on site will be managed throughout the operation phase. The aim of the operation phase

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| | woodland management will be to establish a native woodland within the site. The key objectives of for the operation phase woodland management:<br><br>• The management of the woodland will be overseen by professionals (forester/arborist/landscaper/ecologist) with experience in managing native woodlands. A professional will be engaged throughout the operation phase of the project to supervise the management of the woodland habitats on site.<br>• In areas of retained woodland the woodland will be rotated on a continuous basis to increase the percentage of native broad-leaved tree species canopy cover and decrease the percentage of scrub cover. A key aim of the woodland management will be to replace species-poor dense thicket of Ulex europeaus and Prunus spinosa with a more diverse range of native woodland species.<br>• Mature trees taller trees will be retained within the woodland.<br>• The native species to be used will be Quercus robur, Ilex aquifolium, Crataegus mongyna, Betula pubescens, Sorbus aucuparia and Prunus spinosa will be form the species mix for trees within the woodland. Planting of Fraxinus excelsior is not appropriate at this time due to the threat of ash dieback disease. The use of Fraxinus excelsior will be revisited during the operation phase of the project and where future conditions allow, this species will form part of the species mix to be planted when rotating sycamore trees.<br>• The rotation of mature trees will be undertaken throughout the operation phase and will be completed while still maintaining woodland cover within the retained woodland areas.<br>• Retain cut wood logs as stash piles on the woodland floor to provide habitat variation and decomposition matter for the woodland.<br>• Enhance habitat for fauna along woodland edges, particularly invertebrates including butterfly species. This will be achieved through the provision of scalloped edges to woodland habitat that increases shelter conditions for invertebrate as well as other fauna.<br>• Provide wildlife enhancement within the woodland during the operation phase. Enhancement measures that will be implemented during the operation phase will include the provision of bat boxes (a minimum of 3 will be provided within the project site throughout the operation phase) and bird boxes (a minimum of 3 will be provided throughout the operation phase)<br><br>**Measures to Mitigate Impacts for Bats** |

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| | The lighting design in the vicinity of habitat features that offer suitable foraging bats, such as woodland habitats to the north of the proposed development that are to be retained and enhanced will be provided as part of the project landscaping, The lighting for the proposed development has been prepared in line with best practice measures for minimising the impacts of artificial lighting to bats, as detailed in the Institute of Public Lighting 2018 guidance document Bats and Artificial Lighting in the UK. This lighting plan aims to limit lighting and light spill on to these habitats to ensure that optimum foraging conditions, that include unlit and low artificial light over the woodland and meadow grassland habitats that provide suitable habitat for bats such as Common pipistrelle and Leisler's bat.<br><br>The retention of woodland habitat within the landholding along the north of the site connecting the western and eastern extent of the landholding and along the eastern boundary connecting the south side of the landholding north to the Glenamought River will ensure that connectivity in the landscape from west to east and north to south is retained and fragmentation of the wider landscape is avoided.<br><br>**Measures to Manage Surface Water Runoff**<br>A surface water management design has been prepared for the proposed development and will be implemented for the operation phase. The network has been designed in accordance with the GDSDS and incorporates onsite attenuation, full hydrocarbon and silt interceptors, hydrobrakes and the discharge of surface water from the proposed development at green field runoff rates. Nature-based solutions, such as SuDS have also been incorporated into the design of the project and will further provide for the effective management of surface water runoff generated at the project site during the operation phase. As part of the nature-based solutions a new constructed stream will be provided to convey flows from the western attenuation tank and horizontal directional drilled pipe to the Glenamought River. The new constructed stream channel will provide habitat heterogeneity within the woodland areas to the north of the landholding and has the potential to provide additional habitat for foraging habitat for invertebrates, bird and bat species. Conceptual examples of the new constructed stream are shown on Figure 14.7 below. |
| **Archaeology** | **Construction Phase**<br>Given the scale and extent of the proposed development within a green field location, a programme of archaeological test trenching, under licence by the National Monuments Service, will be carried within the undisturbed areas of the proposed development site in advance of the construction |

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| | phase. In the event that any sub-surface archaeological deposits, features or artefacts are identified during these site investigations, their locations will be recorded and securely cordoned off while the National Monuments Service are notified of the discovery and consulted to determine further mitigation measures, which may entail preservation in situ by avoidance or preservation by record through a systematic archaeological excavation. A detailed building survey of the farm buildings within the proposed development site will be compiled in written and photographic formats in advance of the construction phase.<br><br>There are a number of obligatory processes to be undertaken as part of applications to the National Monuments Service for licences to carry out archaeological test trench excavations and these will allow for monitoring of the successful implementation of mitigation measures. A detailed method statement stating the proposed strategy for the site investigations will accompany the submitted licence application which will clearly detail the extent of the archaeological works and outline the processes to be enacted in the event that any archaeological features are encountered. Reports on the archaeological site investigations will then be submitted to the National Monuments Service, the National Museum of Ireland and the Planning Authority which will clearly describe the results of all archaeological works in written, mapped and photographic formats. A copy of the building survey of the derelict farm buildings within the proposed development site will be submitted to Cork City Council. |
| **Water & Hydrology** | The main potential impacts are associated with the Construction Phase of the proposed development. The mitigation measures in relation to the achievement of a high quality of surface water runoff from the development and groundwater protection will ensure that the status of both surface water and groundwater bodies in the vicinity of the site will be at least maintained (see WFD water body status and objectives) regardless of their existing status. The following Best Practice Guidance relating to water control will be adhered to at all stages of construction. CIRIA (Construction Industry Research and Information Association) 2006: Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006) and CIRIA 2006: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2006.<br><br>The following mitigation measures will be put in place to minimise and mitigate the potential impacts to the ground and surface water at the site: |

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| | • Excavated soils and rock will be temporarily stockpiled and stored away from any ditch or surface water drainage network to prevent any suspended solids from entering same.<br>• Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement areas, where measures will be implemented to capture and treat sediment- laden runoff prior to discharge of surface water at a controlled rate.<br>• Silt-fences will be installed at upper sides of the existing vegetated areas to the north of the development area to protect the existing watercourse from unintended silt runoff.<br>• Protection measures will be put in place to ensure that all materials used during the construction phase are appropriately handled, stored, and disposed of in accordance with recognized standards and manufacturer's guidance. Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater.<br>• Designated impermeable fuelling areas will be constructed. Fuels, oils, solvents, and other chemicals used during construction will be stored within temporary bunded storage in designated areas of the site. Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996 (as amended).<br>• Refuelling of construction vehicles and hydraulic oils or lubricants to vehicles will take place off-site or in designated hardstanding areas away from surface water drainage in order to minimise the potential contamination of the water environment. Spill kits and drip trays will be kept in the designated areas in the events of spillage during refuelling of the construction vehicles and machineries. All relevant personnel will be fully trained in the use of this equipment. Attention and care to be taken during the refuelling and maintenance operation.<br>• All concrete batching and mixing activities will be located in areas away from watercourses and drains.<br>• Concrete batching and concrete wash down or wash out of concrete trucks will take place off site or in a designated area with an impermeable surface and appropriate drainage/interception/collection measures in place. Spills of concrete, cement, grout, or similar materials will not be hosed into drains.<br>• Discharge from any vehicle wheel wash areas is to be directed to onsite settlement areas, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility. |

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| | • Regular inspection of surface water run-off and any sediment control measures e.g. silt traps will be carried out during the Construction Phase.<br>• Regular auditing of construction/mitigation measures will be undertaken e.g. concrete pouring, refuelling in designated areas etc.<br><br>**Operational Phase**<br>The developed site will be predominantly covered in hardstanding. The impermeable surface will minimise the potential influx of any contaminants into soils and underlying groundwater.<br><br>Surface water runoff arising on site during the operational phase will be directed to the surface water drainage system and then via an appropriately designed system such as petrol or hydrocarbon interceptor and silt traps that remove the contaminants from runoff prior to discharge to the final outfall point.<br>Any accidental leak from drainage to car parks or road areas will be discharged through appropriate oil interceptor to the drainage system.<br><br>A regular maintenance and inspection programme of the flow control devices, attenuation storage facilities, SuDS measures, gullies and petrol interceptors will be required during the Operational Phase to ensure the proper working of the development's networks and discharges.<br><br>Attenuation and nature-based SuDS measures will be provided to ensure that the discharge rate is maintained at greenfield runoff rate. The attenuation facility and SuDS features will accommodate rainfall events up to, and including, the 1-in-100-year storm event with a 10% allowance for further flow increases due to climate change. Surface water runoff from the site will be managed and attenuated to the greenfield runoff rate as recommended in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by SuDS features and Hydro-brake flow control devices, with ground level nature-based features such as swales and tree-pits and underground attenuation tanks, provided to store runoff from a 1 in 100-year return period event.<br><br>Due to the various measures including the attenuation systems with hydrocarbon interception and the design of the wider drainage system in line with SuDS, the likelihood of any spills entering the water environment is negligible.<br><br>No future surface water monitoring is proposed as part of the proposed project due to the low hazard potential at the development. |

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| | Oil interceptor(s) will be maintained and cleaned out in accordance with the manufacturer's instructions.<br><br>Maintenance of the surface water and foul sewer drainage systems as per normal urban developments is recommended to minimise any accidental discharges to ground.<br><br>The performance of all SuDS features will be monitored by the relevant authorities during the life of the development.<br><br>Monitoring of the installed hydro brake, interceptors and gullies will be required to prevent contamination and increased runoff from the site. |
| **Resources and Waste Management** | The management of waste during the construction phase will be monitored by the Contactor's appointed Waste Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.<br><br>**Construction phase**<br>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 demolition, excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e., progress and meeting construction schedule targets. The C&D RWMP specifies the need for a Waste 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 Waste 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.<br><br>**Operational phase**<br>Monitoring of the waste generated during the operational phase will be carried out to determine its appropriate suitability for re-use, recovery or disposal offsite. |

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| | Such monitoring will be carried by the Management Company as part of its legal responsibilities and by the Local Authority under its remit under waste legislation. |
| **Population and Human Health** | Measures to avoid negative impacts on Population and Human Health are largely integrated in to the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development.<br><br>Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission.<br><br>Monitoring of compliance with Health & Safety requirements will be undertaken by the Project Supervisor for the Construction Process. |
| **Material Assets** | Service providers have been and will continue to be consulted throughout the design and construction process. Requirements for each service will be agreed with the respective provider and a representative of the service provider will be present on site as necessary during the works for monitoring purposes. |
| **Major Accidents and Disasters** | **Monitoring during Construction**<br>Aside from the monitoring measures to be carried out by the contractor, as outlined in the CEMP (e.g., site inspections and audits) and throughout the EIAR, no additional monitoring is considered necessary during the construction phase of the proposed development.<br><br>**Monitoring during Operation**<br>No additional monitoring is considered necessary during the operational phase of the proposed development. |

**Table 20.2 Summary of Monitoring**

## 20.4 Summary of Residual Effects

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| **Traffic and Transportation** | The effects of the development on the traffic network are considered slight, taking account of the conservative modelling approach and the mitigation measures outlined above. |
| **Air Quality and Climate** | A comprehensive construction management programme will be required prior to demolition and construction operations commencing for the proposed project. This will minimise any impact on the local community. |

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| | Normal routine operational impacts from this installation will not be significant and in line with EU Air quality standards. A summary of the residual impacts from the operational and construction phase of the development is detailed in Table 8-28. |
| **Noise and Vibration** | **Construction Phase**<br>The application of the practicable noise control measures detailed in Section 9.6.1 and controlled hours of working should ensure that the impact of construction noise and vibration is mostly within the criteria limits established in this report and is minimised as far as practicable.<br><br>There are likely to be slight exceedances of the criteria by 1 - 2dB(A) at the nearest Old Whitechurch Road dwellings but these exceedances would be considered slight and will be very in nature<br><br>**Operational Phase**<br>The application of the practicable noise control measures detailed in Section 9.6.1 should ensure that the impact of operational noise and vibration is within the criteria limits established in this report and is minimised as far as practicable.<br><br>Noise emissions from additional traffic along Old Whitechurch Road due to the proposed development will result in a 5dB increase at the residential dwellings located along Old Whitechurch Road (particularly to the south of the proposed development). However, noise emissions from the road are not expected to exceed NRA minimum threshold criteria for noise emissions from roadways.<br><br>Noise emissions from the creche will also alter the current characteristic of the ambient noise environment in the vicinity of a few residential dwellings located along Old Whitechurch Road but noise emissions are predicted to be within criteria and consistent with or below the existing noise levels at the nearest noise sensitive locations so the likely amount of noise transmission to these dwellings would therefore not be considered significant. |
| **Biodiversity** | The residual impacts associated with the proposed development will comprise the loss of semi-improved grassland and recolonising grassland mosaic habitat to the proposed development footprint.<br><br>The loss of these habitats has been assessed as being of minor negative significance. The provision of meadow grassland habitats that will be managed throughout the operation phase of the proposed development |

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| | for biodiversity will further offset the loss of these habitats such that the residual impact is assessed as being representative of an effect of negligible significance.<br><br>There will be a minor loss of bat foraging habitat relied upon by Leisler's bat and Common pipistrelle. The retention of woodland habitat to the north of the project site and the maintenance of habitat corridors connecting lands to the west and east of the landholding via woodland to the north will ensure that foraging habitat and connectivity in the landscape continues to be provided for bat species. Furthermore the enhancement of woodland habitat with native tree species that are known to support higher abundance and diversity of invertebrates than existing Ulex europeaus and Prunus spinosa dominated scrub habitat will enhance foraging conditions for bat within the landholding.<br><br>There will be a loss of potentially suitable foraging habitat for yellowhammer to the footprint of the proposed development. This loss has been assessed as an effect of minor negative significance. This effect will be further minimised by the provision of compensatory foraging habitat within areas of open long sward meadow to the north of the proposed development footprint. |
| **Archaeology and Cultural Heritage** | **Construction Phase**<br>The proposed development site does not contain any known archaeological sites or designated architectural heritage structures and no residual impacts on these elements of the cultural heritage resource are predicted. The mitigation measures presented in Section 11.5.1.1 will provide for either the preservation in situ of any currently unknown archaeological features within the proposed development site or the proper and adequate recording of this resource by full archaeological excavation. Preservation in situ shall allow for a negligible magnitude of impact resulting in a potential not significant/imperceptible significance of effect in the context of residual impact on the unrecorded archaeological resource. Preservation by record shall allow for a high magnitude of impact, albeit ameliorated by the creation of a full and detailed archaeological record, the results of which shall be publicly disseminated. This shall result in a potential slight/moderate negative range of significance of effect in the context of residual impacts on the unrecorded archaeological resource. The removal of the undesignated, derelict farm buildings within the site will result in a high magnitude of impact on features of low cultural heritage value and this will be ameliorated by the creation of a detailed building survey which shall result in a slight/moderate negative range of significance of effect in the context of residual impacts on the undesignated cultural heritage resource. |

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| | **Operation Phase**<br>Following the successful implementation of the mitigation measures presented no residual impacts are predicted to arise during the operational phase of the proposed development. |
| **Landscape & Visual Impact** | Cork is an expanding city and the proposed zoned development lands at Kilbarry are in the vicinity of a range of other existing urban land uses and lands zoned for residential and commercial developments. The construction of a residential development will therefore infill, a gap at the edge of the city resulting in a new residential neighbourhood in the townscape already in place with proposed park, existing sporting amenities and employment opportunities within a short distance allows for sustainable transport choices for future residents. The site urban fringe location overlooking a future 21.3Ha Public Park and biodiversity corridor with an outlook to the metropolitan greenbelt.<br><br>With mitigation strategies in place, the development once completed will generally result in neutral to slight negative impact, the negative impacts arising are due primarily to the change from open pasture lands to a residential neighbourhood. The development overall will not have any significant or profound residual landscape or visual impacts except on the individual property dwellings at close proximity accustomed to a rural outlook. The design of the proposed development has, however, mitigated the extent of impacts where ever possible. These dwellings are surrounded by or overlook lands zoned for change from agricultural to residential and commercial use. It is therefore an inevitability that they too become integral elements in the expanded townscape.<br><br>The Kilbarry development will become a permanent element on the urban edge of Cork City and the proposed building front out toward the park area with excellent elevational treatments and with sub-division into character areas to reduce the overall volume of development. The visual impact of the proposed development will be permanent as the open space landscape in existence in the valley below the housing is to be conserved as existing to protect biodiversity. This involves avoiding overshadowing of the existing meadow areas therefore, it is a requirement to minimise the amount of tree planting along the northern edge of the residential area. The proposed buildings will therefore not become more screened by maturing trees in the future. |
| **Land and Soils** | An overall analysis of the impacts, in the light of the proposed mitigation measures, concludes that all of the potential impacts (both during |

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| | construction and operational stage) are predicted to be reduced to Neutral quality and Negligible magnitude. |
| **Water & Hydrology** | An overall analysis of the impacts considering the proposed mitigation measures concludes that all of the potential impacts (both construction and operational impacts) are predicted to be reduced to a neutral quality, imperceptible significance. |
| **Resources and Waste Management** | The implementation of the mitigation measures outlined in Section **Error! Reference source not found.** 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. This will also assist with pest control through the various phases of the development. 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.<br><br>**Construction phase**<br>The management of waste during the construction phase in accordance with the CEMP will meet the requirements of regional and national waste legislation. The residual effect of demolition, excavation and general construction waste on the environment during the construction and demolition phase will be short term, imperceptible and neutral.<br><br>**Operational phase**<br>During the operational phase, a structured approach to waste management as set out in Section 15.6 will promote resource efficiency and waste minimization. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be long term, imperceptible and neutral. |
| **Population and Human Health** | It is anticipated that the proposed development will realise significant positive overall economic and social benefits for the local community and the wider Cork City area.<br><br>Strict adherence to the mitigation measures recommended in this EIAR will ensure that there will be no negative residual impacts or effects on Population and Human Health from the construction and operation of the proposed scheme. Indeed, the delivery of much needed housing and student accommodation will realise a likely significant positive effect for the local area. |
| **Material Assets** | **Foul Water Drainage** |

The development will generate additional foul sewage flows to the existing foul sewage network and municipal wastewater treatment facilities, but the volume of these additional flows is minor in the context of the capacity of the existing network and treatment facilities. Irish Water have provided us with figures (2020) for Carrigrennan WWTP.

- The peak hydraulic capacity at the Carrigrennan WWTP is 359,592 $m^3$/day
- The annual max flow to the WWTP is 266,498 m3/day
- The annual mean flow to the WWTP is 126,805 m3/day
- The Organic capacity at the WWTP is 413,200 PE
- The collected load at the WWTP (peak week) is 241,480 PE

Based on the above there is significant spare capacity at the WWTP to accept the flows from the proposed development.

Following mitigation measures proposed there will be no residual impacts on foul water infrastructure after construction work is completed.

Following mitigation measures proposed the residual impacts on foul water infrastructure during operation are long term but minimal for the existing municipal wastewater treatment plant and long term but minimal for the existing foul sewer network.

**Potable Water**

Potable water will be provided by connecting to the public water mains which are fed from the existing Irish water network. Within the site the water will be distributed via a network of 100mm and 150mm diameter water main pipes, the design and construction of the network will be in accordance with the Water Supply Code of Practice published by Irish Water. The development will generate additional water demand on the existing water supply network and municipal water treatment facilities, although the volume of these additional flows is minor in the context of the capacity of the existing network and treatment facilities.

The additional demand arising from the development is minor in the context of the capacity of the existing water supply network in the area and therefore the residual impacts on existing potable water infrastructure during the operational phase of the development will be long term but minimal.

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| | **Power, Gas and Telecommunications**<br>No significant residual impacts from either the construction or operational phases of the development are likely, as a consequence of the connection to the Power, Gas and Telecommunications networks. |
| **Major Accidents and Disasters** | **Residual Effects during Construction**<br>The risk of a major accident and/or disaster during the construction of the proposed development is considered 'low' in accordance with the risk evaluation methodology. It is considered that the proposed development will not give rise to significant residual effects.<br><br>**Residual Effects during Operation**<br>The risk of a major accident and/or disaster during the operation of the proposed development is considered 'low' with regards the risk evaluation methodology. It is therefore considered that there is no significant residual effect(s) during the operation of the proposed development. |

**Table 20.3 Summary of Residual Effects**