Volume 2

Environmental Impact Assessment Report

FOR

Kilternan Village

Strategic Housing Development

AT

Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18

June 2022

ON BEHALF OF

Liscove Limited

Prepared by
Enviroguide Consulting

Dublin
3D Core C, Block 71, The Plaza,
Park West, Dublin 12

Kerry
19 Henry Street
Kenmare, Co. Kerry

Wexford
M10, Wexford Enterprise
Centre, Strandfield Business
Park, Rosslare Road, Wexford

www.enviroguide.ie
info@enviroguide.ie
+353 1 565 4730

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

A. Appendix A Site Drawings

B. Appendix B Energy Statement

C. Appendix C Site-Specific Flood Risk Assessment

D. Appendix D Biodiversity Chapter Appendix

E. Appendix E Engineering Infrastructure and Stormwater Impact Assessment Report

F. Appendix F Telecommunications Report

G. Appendix G Photomontage Report

H. Appendix H ProPG: Acoustic Design Statement Report

1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been commissioned by the Applicant, Liscove Limited, in respect of the Proposed Kilternan Village SHD Development at a site located at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18 for a Strategic Housing Development.

This EIAR has been compiled in accordance with all current legislation and best practice guidance. This Chapter describes the methodology by which the Environmental Impact Assessment (EIA) was carried out and the EIAR was completed. The methodology used is broadly consistent across all Chapters in order to ensure the EIAR is clear and easy to navigate.

1.1.1 Quality Assurance and Competence

Synergy Environmental Ltd., T/A Enviroguide Consulting, is a wholly Irish Owned multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All of our consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Professional memberships include the Institute of Geologists of Ireland (IGI), Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction and Archaeology and Cultural Heritage Chapters of EIARs.

1.1.2 Description of the Proposed Development

The Proposed Development (as detailed in Chapter 2) comprises of:

The demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as ‘Rockville’ and associated derelict outbuildings; and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre, which will provide a creche (439 sq m), office (317 sq m), medical (147 sq m), retail (857 sq m), convenience retail (431 sq m) and a community facility (321 sq m). The 383 No. residential units will consist of 27 No. 1 bedroom units (19 No. apartments and 8 No. duplexes), 128 No. 2 bedroom units (78 No. apartments and 50 No. duplexes), 171 No. 3 bedroom units (108 No. houses, 3 No. apartments and 60

No. duplexes) and 57 No. 4 bedroom units (57 No. houses). The proposed development will range in height from 2 No. to 5 No. storeys (including podium/undercroft level in Apartment Blocks C and D and in the Neighbourhood Centre).

The 383 No. residential units will consist of:

- 27 No. 1 bedroom units (19 No. apartments and 8 No. duplexes),
- 128 No. 2 bedroom units (78 No. apartments and 50 No. duplexes),
- 171 No. 3 bedroom units (108 No. houses, 3 No. apartments and 60 No. duplexes) and
- 57 No. 4 bedroom units (57 No. houses).

A full description of the Proposed Development is detailed in Chapter 2 of this EIAR.

1.2 Definition of EIA and EIAR

EIA is a systematic examination of the potential impacts of a Proposed Development on the environment. In assessing the environmental impacts, this EIAR will evaluate the existing situation and assess any potential impacts of the Proposed Development. Where potential impacts are identified proposed mitigation measures will be identified. In addition, the in-combination effects of any other known plans or projects will be identified and assessed.

Under Schedule 5 of the Planning and Development Regulations 2001, as amended (the Planning Regulations), an EIAR (formerly an EIS) is required to accompany certain planning applications for specified projects as part of the EIA process.

The EIAR describes the outcomes of the iterative EIA process which was progressed in parallel with the project design process. In doing so, it forms the first part of the EIA process that will be completed by An Bord Pleanala, as the competent authority, which in turn will be required to examine, analyse, and evaluate the direct and indirect effects of the development on the various factors listed in Directive 2011/92/EU, as amended by 2014/52/EU (the EIA Directive).

> *"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" (EPA, 2022)*

Where significant and likely environmental effects are identified that are unacceptable, the EIA process aims to quantify and minimise the effects of the impact that the specified development has on the environment through appropriate mitigation measures and where necessary, subsequent monitoring.

This process is illustrated in Figure 1-1.

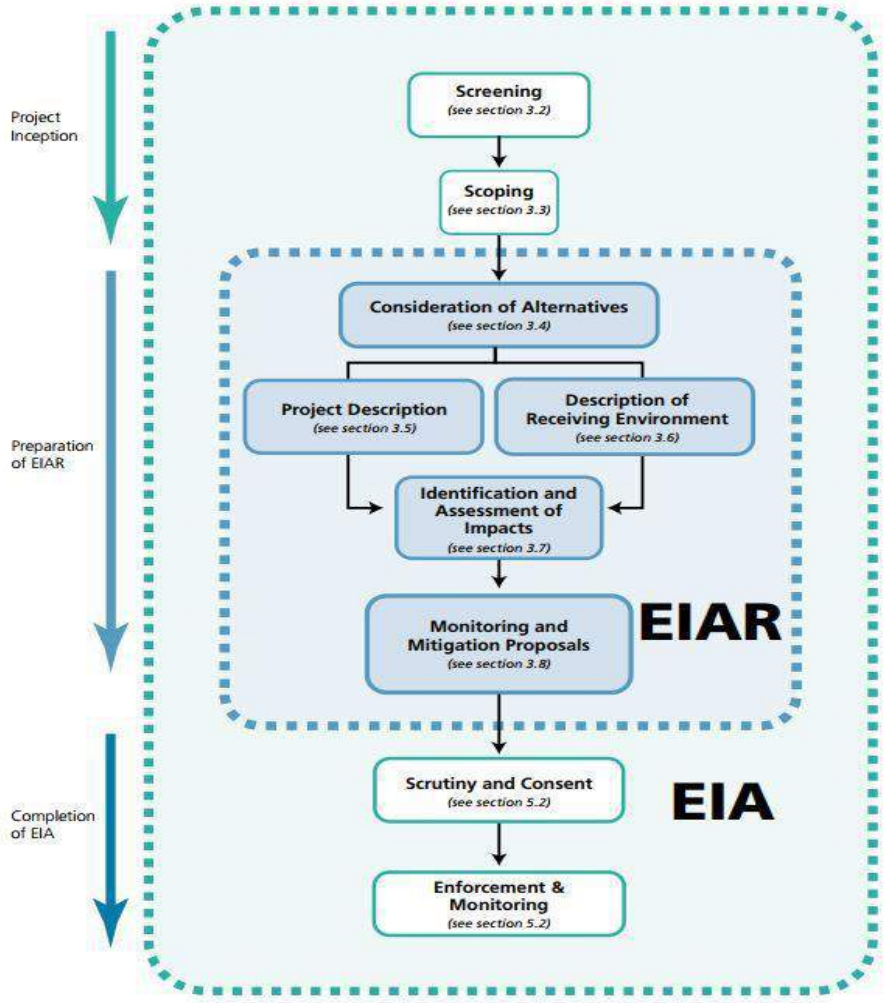

Figure 1-1: EIA Process

The purpose of the EIAR is to provide the Planning Authority with information on the likely and significant effects on the environment as a result of the Proposed Development. This EIAR was prepared in parallel with the project design process and reflects the potential cumulative impact of other developments.

1.3 EIA Legislation

The EIA Directive requires EIA to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive is transposed into Irish law through the Planning and Development Act 2000 (as amended) (the Planning Act) and the Planning and Development Regulations (2001-2022).

1.4 EIA Guidelines

This EIAR has been prepared in accordance with all relevant guidance. The documents listed below are common to all Chapters. Additional specific guidelines will be referred to in each specific Chapter.

- Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2002);

- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA May 2022);
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2017);
- Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) (European Union 2017);
- Guidance of Integrating Climate Change and Biodviersity into Environmental Impact Assessment (European Union 2013);
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Union 2017);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Government of Ireland 2018);
- Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems; (Department of Housing, Planning, Community and Local Government 2017);
- Circular PL 05/2018 -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) And Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government 2018);
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999); and
- Implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (European Communities 2003).
- Office of the Planning Regulator (OPR) Environmental Impact Assessment Screening Practice Note (2021).

The EIA Directive defines EIA as a process. Article 1(2)(g) states that EIA means:

> *"(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);*

(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;

(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;

(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point;

(iii) and, where appropriate, its own supplementary examination; and

(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a".

The EIA Directive requires the EIAR to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct, indirect and cumulative significant effects of the Proposed Development on factors of the environment including:

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 (respectively, the Habitats Directive and the Birds Directive)

c) Land, soil, water, air, and climate

d) Material assets, cultural heritage, and the landscape

The interaction between the factors referred to in points (a) to (d)

1.5 Screening for EIA

'Screening' is the term used to describe the process for determining whether a Proposed Development requires an EIA by reference to mandatory legislative threshold requirements or in the case of sub threshold development, by reference to the type and scale of the proposed development and the significance or the environmental sensitivity of the receiving baseline environment.

Annex 1 of the EIA Directive requires as mandatory an EIA for all development projects listed therein.

Schedule 5, Part 1, of the Planning and Development Regulations (2001 – 2022) transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development.

Schedule 5, Part 2 of the Planning Regulations defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

> *10. Infrastructure projects*
>
> (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.)

The Proposed Development does constitute an "urban development" as it is a housing development. According to the Interpretation of Definitions of Project Categories of Annex I and II Document (European Commission, 2015), "*Housing developments, in particular, are frequently included in the 'urban development projects' category*". The Proposed Development site area and drainage and roads works areas will provide a total application site area of 11.2 hectares (Ha) with a developable site area of 10.8 Ha.

The Proposed Development is not within a "business district" as defined above. Therefore, the two-hectare threshold is not applicable in this case, and the ten-hectare threshold applies instead. As the total application site area is 11.2 Ha, with a developable site area of 10.8 Ha, it is above the 10-hectare threshold for a built-up area and accordingly a mandatory EIAR is required.

1.6 Scope of the EIAR

'Scoping' is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. It is defined in EC Guidance on EIA Scoping 2001[1] as:

> *'Determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR'*

The content of this EIAR was informed by a scoping process carried out by the Applicant, design team and EIAR consultants to identify the core issues likely to be most important during the EIA process.

The EIAR prepared for the Proposed Development has endeavoured to be as thorough as possible and therefore all the issues listed in Schedule 6, Sections 1 and 2 of the Planning Regulations (2001 – 2022) have been addressed in the EIAR.

The scope of this EIAR has had regard to the documents listed in Section 1.4 above, together with:

[1] Guidance on EIA Scoping European Commission June 2001

- The requirements of Part X of the Planning Act and also Part 10 of the Planning and Development Regulations (2001 – 2022);
- The requirements of the Dun Laoghaire-Rathdown County Development Plan 2022-2028;
- Relevant Regional and National Planning Policy Documents;
- The receiving environment and any vulnerable or sensitive local features and current uses;
- Previous relevant planning history and applications that have been submitted on the Proposed Development site and adjoining lands;
- The likely and significant impacts of the Proposed Development on the environment; and
- Available mitigation measures for reducing or eliminating any potentially significant undesirable impacts.

In addition, the individual Chapters of this EIAR should be referred to for further information on the documents consulted by each individual consultant.

1.7 Purpose and Objectives of the EIAR

The purpose of this EIAR is to assist in the EIA process, by identifying likely significant environmental impacts resulting from the Proposed Development, to describe the means and extent by which they can be reduced or mitigated, to interpret and communicate information about the likely impacts and to provide an input into the decision making and planning process.

The fundamental principles to be followed when preparing an EIAR are:

- Anticipating, avoiding, and reducing significant effects;
- Assessing and pursuing preventative action;
- Maintaining objectivity;
- Ensuring clarity and quality;
- Providing relevant information to decision makers; and
- Facilitating public and stakeholder consultation.

EIA is an iterative process. The EIAR captures this assessment process and describes its outcomes. The EIAR documents the consideration of environmental effects and provides transparent, objective and replicable documentary evidence of the EIA evaluation and decision-making processes.

The EIAR provides information on any identified effects arising as a consequence of the Proposed Development and which:

- Are environmentally based;
- Are likely to occur; and
- Have significant and adverse effects on the environment.

It also documents how the design of the Proposed Development incorporates measures for the purposes of impact avoidance, reduction or amelioration; as well as to explain how significant adverse effects will be avoided.

The key objective of this EIAR is to inform the Planning Authority on the acceptability of the Proposed Development, in carrying out an EIA, in order to reach a decision in the full knowledge of the Proposed Development's likely significant impacts on the environment, if any.

1.8 Format and Structure of this EIAR

The formation of an EIAR necessitates the co-ordination and collation of associated, yet diverse specialised areas of assessment. The EIA approach involves the examination of each environmental factor, describing the existing baseline environment, the Proposed Development, its likely impacts and direct and indirect significant effects pertaining to that environmental factor and mitigation measures, where appropriate.

The topics examined in this EIAR are categorised under the environmental factors prescribed under the EIA Directive:

- Population and Human Health
- Biodiversity
- Land & Soils
- Water
- Air
- Climate
- Material Assets
- Cultural Heritage
- Landscape

The expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters must also be examined.

The structure of the EIAR is set out in Table 1-1.

Table 1-1: Structure of the EIAR

Chapter	Title	Content
1	Introduction and Methodology	Chapter 1 sets out the purpose, methodology and scope of the document.
2	Description of the Proposed Development & Assessment of Alternatives	As required under Article 5(1)(a) of the EIA Directive 2014/52/EU (subsequently referred to as the Directive), Chapter 2 provides a description of the site, design and scale of the Proposed Development, and as required under Article 5(d), an evaluation of the reasonable alternative design approaches.
3	Planning and Development Context	Chapter 3 sets the national, regional and local policy framework for the Proposed Development.
4	Population and Human Health	Chapter 4 covers the requirement for assessment on potentially significant effects to population and human health as required under Article 3(1)(a) of the Directive.
5	Biodiversity	Chapter 5 covers the requirement of Article 3(1)(b) of the Directive to assess potentially significant effects on biodiversity (which previously referred only to 'fauna and flora'), having particular attention to species and habitats protected under the Habitats Directive and the Birds Directive.
6	Land and Soils	Chapter 6 covers the requirement under Article 3(1)(c) of the Directive on Land and Soil to assess the type of soil and geology in the area of the Proposed Development and identifies any potentially significant effects.
7	Hydrology and Hydrogeology	Chapter 7 covers the requirement under Article 3(1)(c) of the Directive to assess potentially significant effects to water quality arising from the Proposed Development. This Chapter will assess any potential effects from pollution and discharges to surface water.
8	Air Quality and Climate	Chapter 8 covers the requirement under Article 3(1)(c) of the Directive on Air and Climate to assess potentially significant effects to air quality in the surrounding environment.

Chapter	Title	Content
9	Noise and Vibration	Chapter 9 covers the requirement to assess potentially significant effects from airborne noise and vibration as required under Article 3(1)(a) of the Directive on Human Health.
10	Landscape and Visual Amenity	Chapter 10 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on the landscape. This Chapter will assess any potential visual impacts to landscape caused by the Proposed Development.
11	Archaeology and Cultural Heritage	Chapter 11 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on cultural heritage.
12	Material Assets _Traffic, Utilities and Waste Management	Chapter 12 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on material assets. This Chapter will identify impacts to existing utilities and infrastructure from the implementation of the Proposed Development. Article 5(1), Annex IV, point 1(d) of the Directive requires estimates of quantities and types of waste produced during construction and operation phase. Chapter 12 will also present an assessment of how resources and waste will be managed for the Proposed Development.
13	Risk Management	Chapter 13 covers the requirement under Article 3(2) of the Directive to include the expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters.
14	Interactions	As required under Article 3(1)(e) of the Directive, Chapter 14 provides an assessment of the interaction between all of the environmental aspects referred to in this EIAR.
15	Mitigation and Monitoring	Chapter 15 describes mitigation and monitoring as required under Article 5(1) of the Directive in order to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, describes any proposed monitoring arrangements.

This approach employs standard descriptive methods, replicable prediction techniques and standardised impact descriptions to provide an appropriate evaluation of each environmental topic under consideration.

1.9 Methodology Used to Produce this EIAR

The methodology employed to produce this EIAR is detailed in Table 1-2. The objective is to evaluate each environmental topic, both individually and collectively, in a systematic and objective manner.

The methodology will outline the methods used to describe the baseline environmental conditions as well as predict the likely impacts on the environment of the Proposed Development. The data and survey requirements for each Chapter will vary depending on the environmental topic and will be chosen by the particular specialist based on relevant legislation, best practice guidance, policy requirements, and professional judgement. Similarly, the study area is also defined for each environmental topic based on professional judgement and experience.

All environmental topics require desktop reviews of all relevant data at a minimum. These desktop studies are then supplemented by field studies and consultations with relevant stakeholders, for example interested parties, statutory bodies and local authorities, as required for each environmental topic.

An outline of the methodology employed consistently in each Chapter of the EIAR to examine each environmental topic is provided in Table 1-2:

Table 1-2: Methodology Employed to Produce each EIAR Chapter

Introduction	Provides an overview of the specialist area and specifies the specialist who prepared the assessment.
Study Methodology	This subsection outlines the method by which the relevant impact assessment has been conducted within that Chapter.
The Existing Receiving Environment (Baseline Situation)	This section will describe and assess the receiving environment, the context, character, significance and sensitivity of the baseline receiving environment into which the Proposed Development will fit. This analysis also takes account of any other Proposed Developments that are likely to proceed in the immediate surroundings.
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 environment that could arise. For each Chapter those characteristics of the Proposed Development which are relevant to the area of study are described; for example, the Chapter on landscape and visual impact addresses issues such as height, design and impact on the surrounding landscape.
Potential Impact of the Proposed Development	This section provides a description of the specific, direct and indirect, effects that the Proposed Development may have. This analysis is provided with reference to both the Existing Receiving Environment and Characteristics of the Proposed Development sections, while also referring to the: (i) magnitude and intensity, (ii) integrity, (iii) duration and (iv) probability of impacts. The assessment addresses whether the impacts are direct, indirect, secondary or cumulative in nature. It also looks at the timescale of such impacts e.g. are they short, medium, long-term, and are they of a temporary, permanent, continuous or intermittent nature, and are they positive or negative impacts. The impact interactions are also addressed.
Do Nothing Impact	In order to provide a qualitative and equitable assessment of the Proposed Development, this section considers the Proposed Development in the context of the likely impacts upon the receiving environment should the Proposed Development not take place.
Avoidance, Remedial and Mitigation Measures	This section of each Chapter describes the mitigation measures which are required. The requirement to describe mitigation measures is laid out in the EIA Directive, as implemented by the Planning Act and the Planning Regulations. Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential impacts of the Proposed Development. This includes avoidance, reduction and

	remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007, to reduce or eliminate any significant adverse impacts identified.
Residual Impacts of the Proposed Development	This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term, temporary, permanent, continuous, or intermittent, positive and negative effects as well as impact interactions which the Proposed Development may have, assuming all mitigation measures are fully and successfully applied.
Monitoring	This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.
Reinstatement	While not applicable to every aspect of the environment considered within the EIAR, certain measures may need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.
Interactions	This section provides a description of impact interactions together with potential indirect, secondary and cumulative impacts.
Difficulties Encountered in Compiling Information	The EIA Directive requires that the EIAR includes *'details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved'* (EIA Directive, Annex IV, Part 6). Each Chapter that contains an environmental baseline and assessment contains a section outlining any difficulties encountered in compiling that Chapter.

1.10 EIAR Project Team

Table 1-3: EIAR Project Team

Chapter	Consultant Name and address	Specialist Area
1.0 Introduction and Methodology including Non-Technical Summary	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt	Multidisciplinary Environmental Consultants
2.0 Project Description and Alternatives Examined	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Environmental Consultants
3.0 Planning & Policy Context	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Mairead Foran Thornton O'Connor Town Planning Patricia Thornton	Multidisciplinary Environmental Consultants Planning Consultant
4.0 Population and Human Health	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt	
5.0 Biodiversity	Scott Cawley Ltd Shea O'Driscoll and Wayne Daly and reviewed by Tim Ryle	Multidisciplinary Environmental Consultants
6.0 Land and Soils	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Gareth Carroll	Multidisciplinary Environmental Consultants
7.0 Hydrology & Water	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Fionnuala Joyce	Multidisciplinary Environmental Consultants
8.0 Air Quality & Climate	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN	Multidisciplinary Environmental Consultants

	Laura Griffin	
9.0 Noise and Vibration	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Laura Griffin	Multidisciplinary Environmental Consultants
10.0 Landscape & Visual Amenity	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nuno Costa	Multidisciplinary Environmental Consultants
11.0 Archaeology, Architectural, and Cultural Heritage	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Laura Griffin	Multidisciplinary Environmental Consultants
12.0 Material Assets: Traffic, Waste, and Utilities	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter Atkins Peter Foley	Multidisciplinary Environmental Consultants Design, engineering and project management consultancy
13.0 Risk Management	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Environmental Consultants
14.0 Interactions	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt	Multidisciplinary Environmental Consultants
15.0 Mitigation and Monitoring Measures	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Louise Hewitt	Multidisciplinary Environmental Consultants

1.11 Non-Technical Summary

A Non-Technical Summary of the EIAR has also been prepared. The EIA Directive states that one of the objectives of the EIA process is to ensure that the public are fully aware of the

environmental implications of any decisions. EPA Guidelines note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made An Bord Pleanala. A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document.

1.12 Links between EIAR and Appropriate Assessment

A Screening Report for Appropriate Assessment (AA) has been carried out for the Proposed Development to determine if there is a risk of effects to any Natura 2000 site. The AA screening concluded that the possibility of any significant effects on any European sites, in the absence of mitigation, whether arising from the Proposed Development alone or in combination with other plans and projects, can be excluded. Accordingly, the Proposed Development does not require a Stage 2 Appropriate Assessment or the preparation of a Natura Impact Statement (NIS).

While AA is required by the proposer of any plan or project likely to have an adverse effect on a Natura 2000 site, EIA is required for projects listed in Annex I of the EIA Directive. The requirement for EIA relative to projects listed in Annex II of the EIA Directive is determined on a case by case. While these two different types of assessment are independent and are required by separate legislation, namely the Birds and Habitat Directives (i.e. AA) and the EIA Directive (i.e. EIAR) there is a degree of overlap, particularly in the biodiversity Chapter of the EIAR.

1.13 Availability of EIAR Documents.

A copy of this EIAR document and Non-Technical Summary is available for purchase at the offices of An Bord Pleanála at a fee not exceeding the reasonable cost of reproducing the document. A copy of this EIAr document is also available on the dedicated website hosted by the applicant www.kilternanvillageshd.ie.

1.14 Statement of Difficulties Encountered

No exceptional difficulties were experienced in compiling the necessary information for the Proposed Development. Where any specific difficulties were encountered these are outlined in the relevant Chapter of the EIAR.

1.15 Quotations

The application is also accompanied by a Non-Technical Summary of the EIAR, which is laid out in a similar, but condensed format to the main EIAR. The structure, presentation and the Non-Technical Summary of the EIAR, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. The core objective is to ensure that the public and local community are aware of the likely environmental impacts of the Proposed Development prior to the granting of permission.

However, it is important to acknowledge that the EIAR by its nature contains statements about the Proposed Development, some of which are positive and some less than positive. Selective

quotation or quotations out of context can give a very misleading impression of the findings of the study. Therefore, the study team urge that quotations should, where reasonably possible, be taken from the conclusions of specialists' sections or from the Non-Technical Summary and not selectively.

The EIA Regulations require that difficulties such as technical deficiencies, lack of information or knowledge encountered in compiling any specified information for the EIAR be described. There were no such difficulties encountered in the production of this EIAR.

2 PROJECT DESCRIPTION & DESCRIPTION OF ALTERNATIVES

2.1 Introduction and Terms of Reference

This Chapter provides a detailed description of the Proposed Development together with details of the existing environment. In accordance with Article 5(1)(a) of the EIA Directive, the description of the project should comprise:

'information on the site, design, size and other relevant features of the project'.

A description of the Proposed Development and its surroundings is provided in this Chapter, together with the proposed design parameters. This description sets the basis against which the specialist assessments presented in this EIAR have been undertaken.

The EIAR must contain information in relation to the environmental impact of both the Proposed Development and all other "reasonable" alternatives studied. An indication of the main reasons for the option chosen must be given, taking into account the effects of the Proposed Development on the environment.

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

2.2 Site Location and Description

Liscove Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at this 11.2 Ha site, with a developable site area of 10.8 Ha, at lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18, which include a derelict dwelling known as 'Rockville' and associated derelict outbuildings, Enniskerry Road, Kilternan, Dublin 18, D18 Y199. The site is generally bounded by the Glenamuck Road to the north; Kilternan Country Market and the Sancta Maria property to the north and west; a recently constructed residential development named "Rockville" to the north-east; the Enniskerry Road to the south-west; dwellings to the south; and lands that will facilitate the future Glenamuck Link Distributor Road to the east. Phase 2 of the residential development Rockville has been granted permission (under two separate Planning References, D18A/0566 (Phase 2A) and D20A/0015 (Phase 2B)), and it is planned to link the Proposed Development into Rockville.

The site of the Proposed Development is currently largely greenfield with hedgerows and treelines, and the surrounding area is predominantly residential and agricultural. Part of the site's frontage lies directly opposite Our Lady of the Wayside Church, Kilternan. The site of the Proposed Development is located 1.9 km to the south-west of the M50 and Carrickmines Retail Park.

2.3 Site History / Background

The site of the Proposed Development was historically open fields separated by field boundaries and hedgerows with building structures in the southern corner of the site. In recent

years the land in the central and northern portion of the site was used as sports pitches by the Former Wayside Celtic Football Club. The lands to the north, west and south of the site of the Proposed Development have been significantly developed in recent years, however the lands adjoining the east of the site remain undeveloped.

Under the Dún Laoghaire-Rathdown County Development Plan (DLR CDP) 2022-2028 (Dún Laoghaire-Rathdown County, March 2022), the lands across the north and east of the site of the Proposed Development are zoned '*Objective A – To provide residential development and improve residential amenity while protecting the existing residential amenities*', while the lands in the western portion of the site are zoned '*Objective NC – to protect, provide for and/or improve mixed-use neighbourhood centre facilities*'.

2.3.1 Planning History for the Site of the Proposed Development

Planning Application Reference - D09A/0471 - Refuse Permission - 05 Oct 2010 (Appeal Refused)

For development on this site of c. 5.97 hectares, comprising the former Wayside Celtic Football Club sports grounds and greenfield lands at Enniskerry Road, Kilternan, Co. Dublin. The site is bounded by Glenamuck Road to the north; "Rockville" (A Protected Structure) to the north-east; agricultural / greenfield lands zoned for development to the east, south-east and south; greenfield lands zoned for development to the south-west; Enniskerry Road to the west; and the Kilternan country Market site and "Sancta Maria" (Residence) to the north-west. The development will consist of the demolition of the existing changing rooms building on site (c. 217 sqm Gross Floor Area (GFA) and the construction of a mixed-use scheme comprising 161 no. residential units, 4 no. retail units, 10 no. office units and 1 no. creche. The residential element of the scheme will comprise of 88 no. houses; 35 no. apartment units; and 38 no. duplex units as follows: 1 no. detached 2 storey plus dormer 4 bed unit (of c. 234 sqm GFA); 2 no. detached 2 storey 3 bed units (ranging from c.118.6 sqm to c. 119.5 sqm GFA); 32 no. semi-detached 2 storey plus dormer 4 bed units (ranging from c. 197 sqm to c. 234 sqm GFA); 6 no. semi-detached 2 storey plus dormer 3 bed units (each c. 138 sqm GFA); 26 no. mid-terrace 2 storey plus dormer 3 bed units (ranging from c. 132.6 sqm to c. 138 sqm GFA); 20 no. end of terrace 2 storey plus dormer 4 bed units (each c. 167 sqm GFA); 1 no. end of terrace 2 storey plus dormer 3 bed unit (of c. 138 sqm GFA). 4 no. 1 bed apartment units (ranging from c. 52 sqm to c. 65 sqm GFA); 3 no. 1 bed apartment units and study (ranging from c. 68 sqm to c. 71 sqm GFA); 20 no. 2 bed apartment units (ranging from c. 78 sqm to c. 97 sqm GFA); 8 no. 3 bed apartment units (ranging from c. 99 sqm to c. 123 sqm GFA); 19 no. 2 bed duplex units (ranging from c. 78 sqm to c. 85 sqm GFA); 19 no. 3 bed duplex units (ranging from c. 110 sqm to c. 121 sqm GFA). (The apartments and duplex units will be provided in 4 no. 3 storey and 1 no. 4 storey blocks). All apartments provided with balconies and / or terraces. The commercial element of the scheme will be accommodation in 2 no. 1-2 and 3 storey blocks and will comprise of 4 no. retail units (ranging from c. 114 sqm to c. 385 sqm); 10 no. office units (ranging from c. 80 sqm to c. 245 sqm) and 1 no. crèche facility (c. 473 sqm GFA). 1 no. signage display at the entrance to the site at Enniskerry Road (total height of c. 6.4 metres). The total advertising display area will be c. 13.1 sqm. The scheme will be accessed via 2 no. vehicular access points (1 no. off Enniskerry Road to the west and 1 no. off Glenamuck Road to the north). New vehicular accesses will also be provided to "Rockville" to the north-east of the site and to lands to the south-east of the site via proposed new internal access roads. Provision of a total of 369 no. car parking spaces and 80 no. bicycle

parking spaces at surface level. All ancillary site development, landscaping, bin storage, and boundary treatment works, including works, including works to the boundary wall of "Rockville" (Protected Structure), which will include the provision of a vehicular access. The scheme also provides for the provision of water / wastewater infrastructure through adjoining lands to the north-east of the site; along Glena muck Road to the north-east; and through lands at Atwood Farm, Glenamuck Road (total length of c. 1,440 metres). The total gross floor area of the proposed residential element is c. 22,176 sqm and for the proposed commercial element is c. 2,657 sqm. The total gross floor area of the overall development is c. 24,833 sqm.

2.4 Project Overview

The Proposed Development will consist of the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings; and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre, which will provide a creche (439 sq m), office (317 sq m), medical (147 sq m), retail (857 sq m), convenience retail (431 sq m) and a community facility (321 sq m). The 383 No. residential units will consist of 27 No. 1 bedroom units (19 No. apartments and 8 No. duplexes), 128 No. 2 bedroom units (78 No. apartments and 50 No. duplexes), 171 No. 3 bedroom units (108 No. houses, 3 No. apartments and 60 No. duplexes) and 57 No. 4 bedroom units (57 No. houses). The proposed development will range in height from 2 No. to 5 No. storeys (including podium/undercroft level in Apartment Blocks C and D and in the Neighbourhood Centre).

The 383 No. residential units will consist of:

- 27 No. 1 bedroom units (19 No. apartments and 8 No. duplexes),
- 128 No. 2 bedroom units (78 No. apartments and 50 No. duplexes),
- 171 No. 3 bedroom units (108 No. houses, 3 No. apartments and 60 No. duplexes) and
- 57 No. 4 bedroom units (57 No. houses).

The Proposed Development will range in height from 2 No. to 5 No. storeys (including podium/undercroft level in Apartment Blocks C and D and in the Neighbourhood Centre).

The Proposed Development has a gross floor space of 43,120 sq m in addition to undercroft levels (under Apartment Blocks C and D measuring 1,347 sq m and under the Neighbourhood Centre measuring 2,183 sq m, which includes parking spaces, external storage, bin storage, bike storage and plant).

Private balconies, terraces and gardens; hard and soft landscaping; sedum roofs; solar panels; boundary treatments; lighting; substations; plant; and all other associated site works above and below ground.

678 No. car parking spaces (110 No. in the undercroft of Blocks C and D and the Neighbourhood Centre and 568 No. at surface level) including 16 No. mobility impaired spaces, 73 No. electric vehicle spaces, 1 No. car share space; 4 No. drop-off spaces/loading bays; motorcycle parking; bicycle parking and bin storage are also proposed.

The Proposed Development will also involve the decommissioning of the existing telecommunications mast (situated along the southern boundary of the site) at ground level

and provision of new telecommunications infrastructure at roof level of the Neighbourhood Centre, including shrouds, antennas and microwave link dishes (18 No. antennas and 6 No. transmission dishes, all enclosed in 9 No. shrouds together with all associated equipment).

The Proposed Development provides for pedestrian links from the Enniskerry Road and within the site to the neighbouring "Rockville" residential development to the north-east and a pedestrian/cycle route through the Dingle Way from the Enniskerry Road to the future Glenamuck Link Distributor Road.

Road works are also proposed to facilitate access to the development from the Enniskerry Road; to the approved Part 8 Enniskerry Road/Glenamuck Road Junction Upgrade Scheme on Glenamuck Road (DLRCC Part 8 Ref PC/IC/01/17); and to the approved Glenamuck District Roads Scheme (GDRS) (ABP Ref:HA06D.303945) on the Glenamuck Link Distributor Road (GLDR). Drainage and water works are also proposed to connect to services on the Glenamuck Road and Enniskerry Road.

At the Glenamuck Road access point, this will include works, inclusive of any necessary tie-ins, to the footpath and cycle track to create a side road access junction incorporating the provision of an uncontrolled pedestrian crossing across the side road junction on a raised table and the changing of the cycle track to a cycle lane at road level as the cycle facility passes the side road junction. Surface water and foul drainage infrastructure is proposed towards the north of the site into the drainage infrastructure to be constructed as part of the Part 8 scheme. Potable water is to be provided from the existing piped infrastructure adjacent to the site along Glenamuck Road. These interfacing works are proposed on an area measuring 0.05 Ha.

At the GLDR access point, this will include works, inclusive of any necessary tie-ins, to the footpath and cycle track to create a side road access junction incorporating the provision of short section of shared path and an uncontrolled shared pedestrian and cyclist crossing across the side road junction on a raised table. The works will also include the provision of a toucan crossing, inclusive of the necessary traffic signal equipment, immediately south of the access point to facilitate pedestrian and cyclist movement across the mainline road. All works at the GLDR access point will include the provision of the necessary tactile paving layouts and are provided on an area measuring 0.06 Ha.

At the Enniskerry Road, works are proposed to facilitate 3 No. new accesses for the development along with modifications to Enniskerry Road. The 3 No. side road priority access junctions incorporate the provision of an uncontrolled pedestrian crossing across the side road junction on a raised table. The modifications to Enniskerry Road fronting the development (320 metres) includes the narrowing of the carriageway down to 6.5 metres (i.e. a 3.25 metres running lane in each direction) from the front of the kerb on western side of Enniskerry Road. The remaining former carriageway, which varies in width of 2 metres, will be reallocated for other road users and will include the introduction of a widened pedestrian footpath and landscaped buffer on the eastern side of the road adjoining the proposed development. The above works are inclusive of all necessary tie-in works such as new kerb along eastern side of Enniskerry Road, drainage details, road marking, signage and public lighting. Potable water is to be provided from the existing piped infrastructure adjacent to the site along the Enniskerry Road. The interface works on Enniskerry Road measures 0.19 Ha.

Surface water and foul drainage infrastructure is proposed to connect into and through the existing/permitted Rockville developments (DLR Reg. Refs. D17A/0793, D18A/0566 and D20A/0015) on a total area measuring 0.09 ha.

In summary, the total red line application site boundary is 11.2 Ha. This includes the Proposed Development site area and all drainage and roads works areas outside the ownership boundary. It is broken down as follows:

- The developable site - 10.8 Ha
- Road and drainage works on Glenamuck Road - 0.05 Ha
- Roadworks at the Glenamuck Link Distributor Road (GLDR) access point - 0.06 Ha
- Road and drainage works on Enniskerry Road - 0.19 Ha, and
- Drainage works connecting into and through the existing/permitted Rockville developments - 0.09 Ha.

Refer to Figure 2-1 for the Location of the Proposed Development and Figure 2-2 for the Proposed Site Layout.

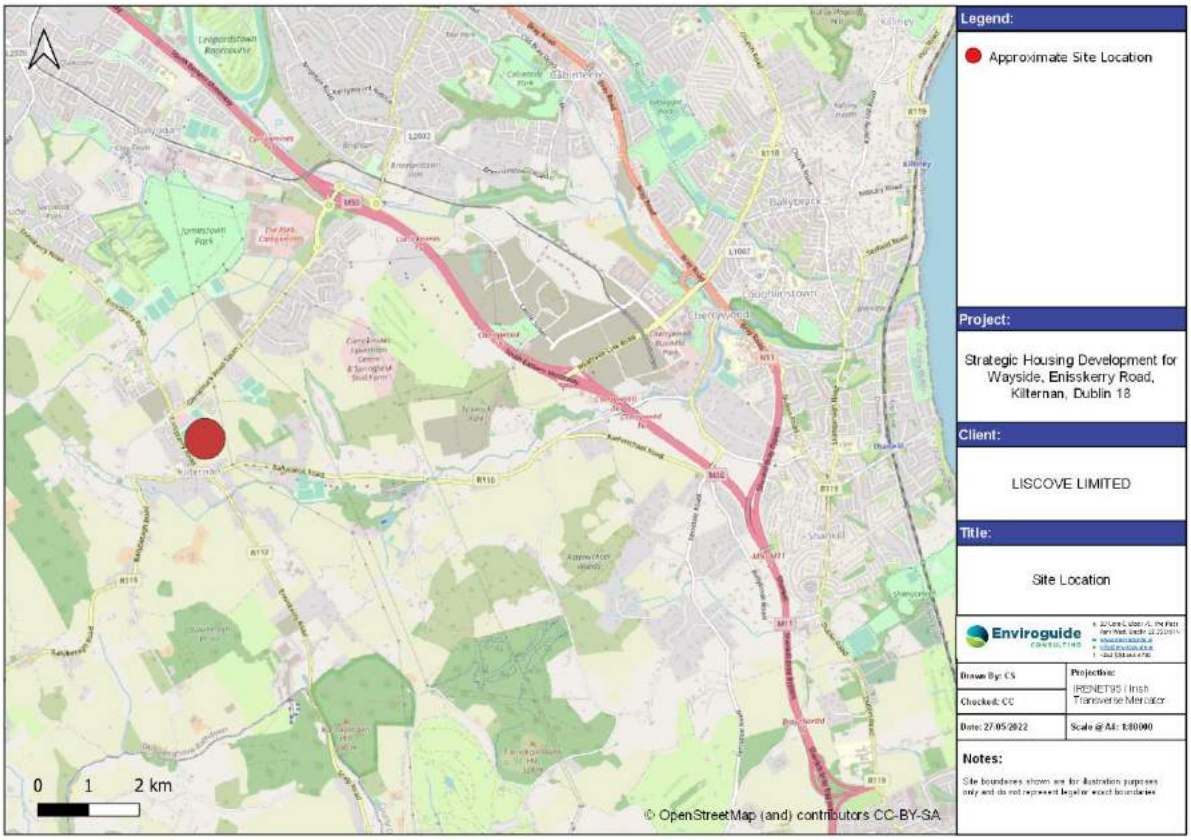

Figure 2-1 Location of the Proposed Development

Figure 2-2 Proposed Site Layout

2.5 Construction Phase

The construction of the Proposed Development is intended to take place in five phases (Phase 1, 2, 3, 4 and 5) starting from the Central Western portion of the site moving in an anti-clockwise direction through Phase 2 to the East and Phase 3 to the North. The southern two sections of the site will be completed next, starting in the south-eastern corner of the site (Phase 4) and moving south westerly to Phase 5. The proposed sequence of construction outlined below is subject to confirmation once the building contract has been awarded and on completion of the Detailed Construction Management Plan for agreement with the relevant Local Authority. The overall duration of the project is estimated to be 5 no. years in total, with some phases overlapping.

The sequencing of the five phases of the Proposed Development is intended to proceed as follows:

- Phase 1 (18 months) – Central Western portion of the site consisting of 91 residential units (made up of houses and duplexes), all associated landscaping works and drainage for Phase 1. The Main Public Open Space, Central Green Way Link, Dingle Way and off-site drainage through southern lands. Access to Glenamuck Link Distributor Road (GLDR) will also be formed in this phase (if the GLDR is in place).
- Phase 2 and Phase 2A (24 months) – Central Eastern portion of the site and the Neighbourhood Centre consisting of 126 residential units (73 in Phase 2 and 53 in Phase

2A) made up of houses, duplexes, and apartments along with all associated landscaping works. The main drainage for Phase 2 and the Neighbourhood Centre will be completed. Access to GLDR will be constructed if not completed in Phase 1.

- Phase 3 (12 months) – North-eastern portion of the site consisting of 59 residential units made up of apartments, with all associated landscaping works, along with the creation of a new access to Glenamuck Road and drainage for Phase 3.
- Phase 4 (18 months) – South-eastern portion of the site consisting of 97 residential units made up of apartments, with all associated landscaping works and drainage for Phase 4.
- Phase 5 (8 months) – South-western portion of the site consisting of 10 residential units made up of apartments, with all associated landscaping work and drainage for Phase 5.

2.6 Statutory Planning Context

The site of the Proposed Development is subject to National, Regional and Local level planning policy. The following outlines the key planning policy documents of relevance to the Proposed Development.

2.6.1 National

- Project Ireland 2040: National Planning Framework (2018)
- Sustainable Urban Housing: Design Standards for New Apartments (2020)
- Urban Development and Building Heights – Guidelines for Planning Authorities (2018)
- Housing for All - a New Housing Plan for Ireland (2021)
- National Policy Position on Climate Action and Low Carbon Development (2014)
- Climate Action Plan (2021)
- Planning System and Flood Risk Management Guidelines (2009)
- Sustainable Residential Development in Urban Areas, Guidelines for Planning Authorities, (2009)
- Urban Design Manual, A Best Practice Guide (2009)
- National Investment Framework for Transport in Ireland (2021)

2.6.2 Regional

- Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031

2.6.3 Local

- Dún Laoghaire Rathdown County Development Plan 2022-2028
- Kilternan Local Area Plan 2013-2019 [extended to September 2023]

Chapter 3, (Planning and Policy Context) of this EIAR details the policies and objectives contained in the various plans and policies that are relevant to the Proposed Development.

2.7 Description of Alternatives

2.7.1 Introduction

Consideration of reasonable alternatives is an important aspect of the EIA process and is necessary to evaluate the likely environmental consequences of a range of development strategies for the site of the Proposed Development within the constraints imposed by environmental and planning conditions. This section provides a description of the reasonable alternatives that have been considered.

Article 5 of the EIA Directive requires that that the EIAR contain:

"A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."

This section of the EIAR provides an explanation of the reasonable alternatives examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the Proposed Development, taking into account and providing a comparison of the environmental effects. The alternatives may be described at four levels:

- Alternative locations
- Alternative designs
- Alternative layouts
- Alternative processes

Pursuant to Section 3.4.1 of the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (*EPA, 2022*), 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'…*"

In accordance with EPA Guidelines (*EPA, 2022*), different types of alternatives may be considered at several key phases during the process. As environmental issues emerge during the preparation of the EIAR, alternative designs may need to be considered early on in the process or alternative mitigation options may need to be considered towards the end of the process.

The EPA Guidelines (EPA, 2022) states:

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

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

2.7.2 Alternative Locations

Three possible alternatives have been considered in terms of alternative locations for the Proposed Development.

1. The Do-Nothing Alternative
2. Develop another greenfield site
3. Purchase another existing site with current planning permission for a similar development

The Do-Nothing Alternative would see the site remain as former playing fields and agricultural lands (grazing of cattle) over an area of 10.8 Ha, including approximately 0.35 Ha of derelict farmyard area.

For another greenfield site to be developed, it has been deemed that a greater impact would be created by the siting of a residential development with a neighbourhood centre at this scale on such a site. The existing site of the Proposed Development lies within lands that have already been zoned for residential development and neighbourhood centre uses, and are currently underutilised in that respect. Additionally large portion of the northern and central areas of the site were previously used as sports pitches/playing fields, while the other areas were used as agricultural land and a farm yard. Hence the entire site has been used for various human uses, whereas if another greenfield site was in an untouched area of outstanding natural beauty, the impact would be worse.

The site of Proposed Development is already owned by the Applicant, hence purchasing another existing site with current planning permission was discounted due to the unlikely availability of such a site on the market and the levels of capital that would be required to purchase such a site. Additionally, the Proposed Development site is well located, served by public transport and is within a short distance of key employment locations such as Kilternan Village, Spetaside Village, Carrickmines, Enniskerry, Sandyford Business District, Dundrum and links to the M50. The Ballyogan Wood LUAS stop is located 2.3 km – 2.7 km to the north-east (26-31 minutes walking distance). Access to the M50 Carrickmines (Exit 15) is located 1.9 km from the site, a 3 No. minute car journey away. Bus route Nos. 44, 63 and 118 serve the Kilternan and Glenamuck area with direct links to Dublin City Centre and institutions such as Dublin City University in Glasnevin. There are also several proposed new bus routes for Kilternan within the Bus Connects scheme will serve Kilternan Village and offer transport links to Dublin City Centre and other suburbs and employment and education facilities in the Greater Dublin Area such as University College Dublin.

The Proposed Development is also well located in relation to natural recreational and amenity areas, as the Dublin Mountains lie approximately 3km to the west of the site of the Proposed Development, and the Irish Sea is located approximately 6km to the east of the Proposed Development.

Having regard to the above alternatives, the selected location is considered the most suitable location for the Proposed Development.

2.7.3 Alternative Uses

The lands across the majority of the north and east of the site of the Proposed Development are zoned '*Objective A – To provide residential development and improve residential amenity while protecting the existing residential amenities', w*hile the lands to the west of the site are

zoned '*Objective NC – to protect, provide for and/or improve mixed-use neighbourhood centre facilities*' under the Dún Laoghaire-Rathdown County Development Plan (DLRCDP) 2022-2028 (Dún Laoghaire-Rathdown County, April 2022).

ZONING OBJECTIVE 'A'
To provide residential development and improve residential amenity while protecting the existing residential amenities.
Permitted in Principle
Assisted Living Accommodation, Community Facility [a], Childcare Service [a], Doctor/Dentist etc. [a], Education[a], Health Centre/ Healthcare Facility [a], Open Space, Public Services, Residential, Residential Institution, Travellers Accommodation.
Open For Consideration
Allotments, Aparthotel, Bring Banks/Bring Centres, Carpark[b], Caravan/Camping Park-Holiday, Caravan Park-Residential, Cemetery, Cultural Use, Embassy, Enterprise Centre, Funeral Home, Garden Centre/Plant Nursery, Guest House, Home Based Economic Activities, Hotel/Motel, Household Fuel Depot, Industry-Light, Part Off-License, Office Based Industry[c], Offices less than 200sq.m.[c], Offices in excess of 200 sq.m.[d], Service Station, Place of Public Worship, Public House, Residential – Build to Rent, Restaurant, Service Garage, Shop Neighbourhood, Student Accommodation, Sports Facility, Tea Room/Café, Veterinary Surgery.
a: Where the use will not have adverse effects on the 'A' zoning objective, 'to provide residential development and improve and improve residential amenity while protecting existing residential amenities'. b: Only as an ancillary component of and directly connected to the primary use and/or ancillary to public transport and/or active travel modes. c: less than 200sq.m. d: Only applies to A zoned lands subject to Specific Local Objective 122.

Figure 2-3 Permissible Use Classes related to Zoning Objective A (Source DLRCDP 2022 - 2028)

ZONING OBJECTIVE 'NC'
'To protect, provide for and/or improve mixed-use neighbourhood centre facilities'.
Permitted In Principle
Advertisements and Advertising Structures, Assisted Living Accommodation, Betting Office, Carpark, Community Facility, Craft Centre/Craft Shop, Childcare Service, Civic Use Cultural Use, Doctor/ Dentist etc., Education, Embassy, Enterprise Centre, Funeral Home, Garden Centre/Plant Nursery, Guest House, Health Centre / Healthcare Facility, Offices less than 300 sq.m., Open Space, Public House, Public Services, Residential, Residential Institution, Restaurant, Service Garage, Shop-Neighbourhood, Sports Facility, Tea Room/ Café, Veterinary Surgery.
Open For Consideration
Aparthotel, Cash and Carry/Wholesale Outlet, Home Based Economic Activities, Hotel/Motel, Household Fuel Depot, Motor Sales Outlet, Nightclub, Off-License, Office Based Industry, Offices over 300 sq.m, Place of Public Worship, Residential – Build to Rent[a], Service Station, Shop-Specialist, Shop District, Student Accommodation[a], Travellers Accommodation.
a: Subject to retaining an appropriate mix of uses.

Figure 2-4 Permissible Use Classes related to Zoning Objective NC (Source DLRCDP 2022 - 2028)

As the Proposed Development consists of residential units and a neighbourhood centre, providing a creche, office space, a medical centre and retail units, the Proposed Development type is listed as Permissible in Principle related to the associated Zoning Objectives, A and NC. As such, it was not considered necessary to consider alternative uses for the Proposed Development.

2.7.4 Alternative Design & Layouts

Both the context and approach to the design and layout of the site of the Proposed Development, and the emerging final design have been subject to consultation with the Dun Laoghaire-Rathdown County Council Planning Department under Section 247 of the Planning and Development Act , 2000 (as amended). A Section 247 meeting took place on Thursday 29th of July 2021, with members of Dún Laoghaire Rathdown County Council, the Applicant and the Design Team in attendance. A tri-partite meeting was held with An Bord Pleanala on Friday the 24th of December 2021.

The overall layout of the Proposed Development aligns with the concepts laid out in the Kilternan Neighbourhood Framework Plan (KNFP) (January 2010), which anticipated that future development around the Neighbourhood Centre would allow for public activities to be "*concentrated around the Village Green to create an atmosphere of vitality. Retail and community buildings will overlook this space*" (KNFP, 2010). Alternative designs for the Proposed Development were considered and developed by the Architects during the design development process, with input from the overall project team. This involved a constantly evolving design whereby different solutions were tested to establish the optimum design.

Figures 2-5 to 2-7 illustrate the earlier design iterations for the subject lands prepared by MCORM Architects:

Figure 2-5: Layout A.

In this early iteration, based on commercial advice, the Neighbourhood Centre component of the scheme was omitted. A more organic layout was developed with primarily houses and duplexes. A small apartment building was also proposed in the South-Eastern corner. The central hedgerows were proposed to be removed to facilitate more traditional housing at the

centre of the development. No clear path for the “Dingle Way” was proposed. The design team were unhappy with the lack of legibility withstanding the fact the future phases would improve this. The minimal development presented to the Enniskerry Road frontage and omission of the Village Green in this phase was viewed by the Design Team as a negative. A density of 37 Units/Ha (U/Ha) resulted.

Figure 2-6 Layout B.

A layout option was proposed considering the full Liscove landholding including a Village Green Neighbourhood Centre. Both the green and commercial component were much smaller than currently proposed. An element of the existing hedgerow was retained as part of a central open space landmark. A curved boulevard like connection from the Enniskerry Road to the Glenamuck Link Distributor Road (GLDR) was proposed as a tree lined “Dingle Way”. The pattern of development remained organic characterised by mainly houses with some duplexes. Although more permeable, the Design team were still not content with the legibility of the scheme. The land area to the East of GLDR was omitted to be considered at a later stage as its only access point was from the GLDR itself. A density similar to layout A of 37 U/Ha was proposed.

Figure 2-7 Layout C.

A more liberal response to the Kilternan Local Area Plan (LAP) and National Framework Plan was developed. A larger Neighbourhood Centre and associated Village Green proposal fronting the Enniskerry Road was developed. The undercroft carparking arrangement proposed for the Neighbourhood Centre Block takes cars off-street reducing car dominance and creating a safer more visually appealing environment for the pedestrian and cyclist. The linear hedgerow running North - South through the site was retained and augmented. A pedestrian and cycle only “Dingle Way” route was introduced. A more formal albeit quite rigid grid was introduced which coupled with the retained landscaped features significantly improved the legibility of the scheme. A strong mix of houses, duplexes and apartments was proposed clearly defining character areas across the scheme. The smaller area of derelict buildings south of the Dingle Way did not form part of the proposal. A density of 45 U/Ha was proposed, the figure outlined for the site in the Kilternan LAP. This layout formed the basis of the current scheme which also includes the area of derelict buildings to the South. The Village Green is fully contained by buildings and overlooked with an enlarged commercial offering and Community Centre facility also included. In the final arrangement, the narrow sliver of lands to the north-west of the site was omitted from the development as it was considered it may be more beneficial to develop it with the lands to the south in the future. Its current narrow width makes it difficult to develop in isolation from the lands to the immediate south (outside the ownership of the Applicant).

Overall, a high-quality final layout and design has been achieved, considering the position of the proposed blocks and units. It is considered that the layout of the Proposed Development is the optimal solution for the lands. It is further considered that the scheme design strikes a balance between respecting the parameters of the Kilternan LAP and ensuring the

development potential of a strategically positioned and underutilised plot is maximised, in the heart of Kilternan Village.

2.7.5 Alternative Process

Due to the nature of the current proposal, where the planning application will be submitted to An Bord Pleanala, it was not considered necessary to consider alternative processes for the Proposed Development.

2.8 The Existence of the Project

The Construction Phase will last approximately 5 years in total, with some phases of the Proposed Development overlapping. During the Construction Phase of the Proposed Development there will be approximately 100 no. jobs created at the peak of construction works. Hence, for the duration of the Construction Phase of the Proposed Development there will be a short-term increase in construction employment in the area, which will have a positive impact, both directly and indirectly, on the local economy.

The Operational Phase of the Proposed Development will result in an increase in the population of the area, and it will have a positive impact on the long-term supply needs of housing in Kilternan. In addition to housing, childcare facilities, office and medical space and retail facilities are located in the Neighbourhood Centre. Hence, the Operational Phase of the Proposed Development will have the potential to create employment in the local area, whilst also providing a high standard of living for new and existing local residents. Employment will be also created by the maintenance and management of the Proposed Development. The provision of passive and active public open space along with the connectivity between the Village Green and the green route 'Dingle Way' that connects the Enniskerry Road with the new GLDR, will have a long-term, positive impact on the local human health and the socio-economic environment.

The primary likely significant environmental impacts of the Proposed Development are fully addressed in the relevant specialist Chapters of this EIAR. These impacts relate to Population and Human Health, Land and Soil, Hydrology and Hydrogeology, Landscape and Visual, Noise and Air Quality and Climate associated with the Proposed Development.

The Proposed Development has the potential for cumulative, secondary, and indirect impacts. These can be difficult to quantify due to complex inter-relationships. All interactions and cumulative impacts have been addressed in Chapter 14 (Interactions) with cumulative impacts and interactions fully addressed in the relevant specialist Chapters of this EIAR.

3 PLANNING AND POLICY

This Chapter of the EIAR gives an overview of the relevant legislation that supports the Proposed Development at a local, regional and national level. It sets out the strategic and statutory context governing the planning and development of the Proposed Development and was prepared by Mairéad Foran. Mairéad Foran has a B.A. (Moderatorship) in Environmental Sciences from Trinity College Dublin, and an Advanced Diploma in Planning and Environmental Law from King's Inns College, Dublin. Mairéad has 4 years professional experience as an Environmental Consultant and experience working on a large number of EIARs and EIA Screening Reports for projects of a similar scale to the Proposed Development.

Liscove Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at this 11.2 Ha site, with a developable site area of 10.8 Ha, at lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18, which include a derelict dwelling known as 'Rockville' and associated derelict outbuildings, Enniskerry Road, Kilternan, Dublin 18, D18 Y199. The site is generally bounded by the Glenamuck Road to the north; Kilternan Country Market and the Sancta Maria property to the north and west; a recently constructed residential development named "Rockville" to the north-east; the Enniskerry Road to the south-west; dwellings to the south; and lands that will facilitate the future Glenamuck Link Distributor Road to the east.

The Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

The following sections describe how the Proposed Development complies with the stated and statutory requirements of Dún Laoghaire-Rathdown County Council, the Kilternan Local Area Plan, and National and Regional planning policy, with respect to planning and sustainable development. The relevant local planning policy with which the Proposed Development complies primarily comprises the Dún Laoghaire-Rathdown County Development Plan 2022-2028.

The site of the Proposed Development is located on land zoned 'Objective A' and 'Objective NC'. Residential use is Permitted in Principle under these zoning objectives. In addition, the lands are also located within the *Kilternan-Glenamuck Local Area Plan 2013 - 2019* [extended to 2023] ("*Kilternan LAP*"). Development Parcels 20B, 20A and 22 of the *Kilternan LAP* are located with the Proposed Development lands.

3.1 National and Regional Planning Policy Context

3.1.1 National Planning Context

3.1.1.1 National Framework Plan

The *Project Ireland 2040: National Planning Framework* (NPF), published on 16th February 2018, replaces the previous National Spatial Strategy. It is the Government's high-level strategic plan for shaping the future growth of the country to the year 2040. It will guide public and private investment and create and promote opportunities for people, and to protect and enhance the environment.

The NPF outlines key future planning and development place making policies for the Eastern and Midland Regions, including a major new policy emphasis on renewing and developing existing settlements with the target of achieving at least 40% of all new housing to be delivered within the existing built-up areas of cities, towns and villages on infill and/or brownfield sites, such as the Proposed Development site.

The National Strategic Outcomes as set out in the NPF are:

- Compact Growth;
- Enhanced Regional Accessibility;
- Strengthened Rural Economies and Communities;
- High-Quality International Connectivity;
- Sustainable Mobility;
- A Strong Economy, supported by Enterprise, Innovation and Skills;
- Enhanced Amenities and Heritage;
- Transition to a Low Carbon and Climate Resilient Society;
- Sustainable Management of Water, Waste, and other Environmental Resources; and
- Access to Quality Childcare, Education and Health Services.

One of the Strategic Investment Priorities outlined in the NPF is the Prioritisation of Housing and Sustainable Urban Development. According to the NPF, the preferred approach in securing both sustainable and compact growth lies within the reuse of previously developed, 'brownfield' land, and either reusing or redeveloping existing sites and buildings. The Proposed Development site achieves this goal and will involve removing a derelict dwelling known as 'Rockville' and associated derelict outbuildings on the site of the Proposed Development and providing residential dwellings and a Neighbourhood Centre.

The NPF - Project Ireland 2040 requires delivery of a likely level of 30-35,000 homes annually up to 2027 in order to meet projected population and economic growth. To achieve the objective of compact growth, 40% of future housing delivery is to be delivered within and close to the existing built-up areas. Within Dublin, the NPF states that the city needs to '*accommodate a greater proportion of the growth it generates within its metropolitan boundaries and to offer improved housing choice*.'

National Policy **Objective 4** in this regards states:

'*Ensure the creation of attractive, liveable, well designed, high quality urban places that are home to diverse and integrated communities that enjoy a high quality of life and well-being*.'

The Proposed Development supports and assists in achieving the following objectives:

National Policy **Objective 11** in this regards states:

'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.'

National Policy **Objective 13** in this regards states:

'*In urban areas, planning and related standards, including in particular building height and car parking will be based on performance criteria that seek to achieve well-designed high quality outcomes in order to achieve targeted growth. These standards will be subject to a range of tolerance that enables alternative solutions to be proposed to achieve stated outcomes, provided public safety is not compromised and the environment is suitably protected*.'

The NPF also includes the following objective in relation to social infrastructure needs:

National Policy **Objective 33**:

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

As defined in the NPF, ideally future homes will be located in places that can support sustainable development - places which support growth, innovation and the efficient provision of infrastructure, are accessible to a range of local services, can encourage the use of public transport, walking and cycling, and help tackle climate change.

The Proposed Development supports the polices and goals outlined in the NPF. The development is located in an area well served by the necessary infrastructure, and which is zoned specifically for uses of this nature.

Further details on how the Proposed Development supports and complies with planning policy and legislation are detailed in the Planning Report and Statement of Consistency (June 2022), by Thornton O'Connor. This Report is submitted separately as part of this application.

3.1.1.2 Sustainable Urban Housing: Design Standards for New Apartments (2020)

The guidelines were originally issued in 2018, as an update of the *Sustainable Urban Housing: Design Standards for New Apartments guidelines*, published in 2015. These 2020 Guidelines are issued as a technical update in relation to 'Shared Accommodation/Co-living'. These Guidelines promote sustainable living patterns with the objective to curb urban sprawl and update previous guidance in the context of greater evidence and knowledge of current and likely future housing demand in Ireland taking account of the Housing Agency National Statement on Housing Demand and Supply, the Government's action programme on housing and homelessness Rebuilding Ireland and Project Ireland 2040 and the National Planning

Framework, published since the 2015 guidelines. The apartment design parameters addressed in these guidelines include the following:

- General locational consideration;
- Apartment mix within apartment schemes;
- Internal space standards for different types of apartments;
- Dual aspect ratios;
- Floor to ceiling height;
- Apartments to stair/lift core ratios;
- Storage spaces;
- Amenity spaces including balconies/patios;
- Car parking; and
- Room dimensions for certain rooms

The Proposed Development has been designed to these current standards.

3.1.2 Urban Development and Building Heights Guidelines for Planning Authorities (2018)

The Urban Development and Building Heights – Guidelines for Planning Authorities, set out national planning policy guidance on building heights with regard to urban areas. The Guidelines supports the strategic policy framework set out in Project Ireland 2040 through the strengthening of policies for consolidation of existing built-up areas, rather than an unsustainable pattern of development whereby many cities and towns continue to grow outwards.

In relation to individual Planning Applications the Guidelines identify that there is a presumption in favour of buildings of increased height in our town/city cores and in other urban locations with good public transport accessibility. In addition, Guidelines set out national planning policy that '*Applies those requirements in setting out relevant planning criteria for considering increased building height in various locations but principally (a) urban and city-centre locations and (b) suburban and wider town locations*.' The Guidelines seek to secure '…*compact and sustainable urban growth'* which means '…*either reusing or redeveloping existing sites and buildings, in well serviced urban locations, particularly those served by good public transport and supporting services, including employment opportunities'*.

The Proposed Development will assist in achieving growth within an already built-up commuter area such as Kilternan. In the context of the Proposed Development, this application is considered to meet the criteria of the Guidelines. The area is serviced by bus route Nos. 44, 63 and 118. The site is also located 1.9 km (20 minutes walking distance) from Carrickmines Retail Park and 2.3 km – 2.7 km to the north-east (26-31 minutes walking distance of the Ballyogan Wood Luas Stop.

3.1.2.1 Building Height and Kilternan Local Area Plan (LAP)

According to the Planning Report and Statement of Consistency by Thornton O'Connor (June 2022), the layout of the Proposed Development has comprehensively considered the position of the proposed blocks and units, and sought to provide a development that both adheres to national policy discourse, whilst also respecting the scale of character of its receiving environment. It is considered that the layout of the scheme as proposed is the optimal solution for the lands (e.g. higher apartment blocks fronting Glenamuck Road will enhance legibility;

the Village Green and Dingle Way will enhance permeability; and the scheme has sought to design around the existing trees on site).

It is further considered that the scheme design strikes a balance between respecting the parameters of the Kilternan LAP and ensuring the development potential of a strategically positioned and underutilised plot is maximised, in the heart of Kilternan Village.

As is detailed extensively in the Material Contravention Statement, the Kilternan LAP prescribes heights of 2-4 No. storeys for the subject lands. The Proposed Development is predominately in accordance with the heights prescribed in the Kilternan LAP, with the majority of the scheme ranging from 2-4 No. storeys across the site. However, Apartment Blocks C and D to the north-east of the site extend to 5 No. storeys including podium level. The apartment blocks are located at the proposed entrance from Glenamuck Road where 4 No. storey elements are within the parameters of the Kilternan LAP. Therefore, the Proposed Development only slightly exceeds the Kilternan LAP parameters by 1 No. storey in a small portion of the site.

It is therefore considered that that the Proposed Development site is capable of achieving increased height and density having regard to the *NPF* and the *Building Height Guidelines*, which encourages increased height and density on appropriate sites, and that the site has the capacity and capability to accommodate a minor increase in height beyond that prescribed in the Kilternan LAP, which was adopted in 2013, well in advance of the Building Height Guidelines (adopted in 2018).

3.1.3 Housing for All | A New Housing Plan for Ireland (2021)

Housing for All - a New Housing Plan for Ireland' is the government's housing policy to 2030. It is a multi-annual, multi-billion-euro plan which will improve Ireland's housing system and deliver more homes of all types for people with different housing needs.

The overall aim of Housing for All is :"*Everyone in the State should have access to a home to purchase or rent at an affordable price, built to a high standard and in the right place, offering a high quality of life*." Housing for All provides four pathways to achieving four overarching objectives:

- *"Supporting Homeownership and Increasing Affordability;*
- *Eradicating Homelessness, Increasing Social Housing Delivery and Supporting Social Inclusion;*
- *Increasing New Housing Supply; and*
- *Addressing Vacancy and Efficient Use of Existing Stock."*

To meet the targets as set out in the National Planning Framework and the measures discussed in the Housing Plan, Ireland needs an average of 33,000 homes constructed per annum until 2030.

The Proposed Development will contribute to the number of residential homes being constructed and will assist in achieving the Housing Policy Objectives outlined in the Plan. The Government's *Housing for All Plan* as well as the policies outlined in the National Planning Framework support the delivery of residential development, such as that proposed. The Proposed Development is located in close proximity to quality public transport routes (the area is

well serviced with public transport, including access to rail, buses, and established walking and cycling paths) and within an existing urban area.

3.2.2 Design Manual for Urban Roads & Streets (DMURS) (2013)

The Design Manual for Urban Roads & Streets (DMURS) was prepared by the Department of Transport, Tourism and Sport, together with the Department of Environment, Community and Local Government in 2013 for Urban Roads and Streets and sets out design guidance and standards for urban roads/streets in Ireland. It also outlines practical design measures to encourage more sustainable travel patterns in urban areas.

Section 5.3 'DMURS' of the Traffic and Transport Assessment by Atkins, sets out the following in relation to people friendly streets and spaces:

'*The street layouts have been developed to deliver a high place function wherein the streets and open spaces form part of the social fabric and are used for congregation and play. Achievement of this function can be greatly facilitated by developing a self-regulating street environment wherein vehicular movement function should be limited, as much as is practicable and a desirable maximum design speed of 20kph being achieved. The street layout accommodates high levels of permeability for pedestrians and cyclists along streets and through open spaces, and onto Enniskerry Road and Glenamuck Road. Vehicular permeability has been predominantly limited to local access only, predominantly for residents with appropriate access provision for emergency and service vehicles. All streets have been designed in the context of achieving a shared street provision in the street carriageway, per the National Cycle Manual, wherein the road space is shared between cyclists and vehicles. The side of the street remains the preserve of the pedestrian on the footway. Paramount to achieving this outcome is significantly limiting vehicle volumes and achieving, by design, a self-regulating desirable maximum speed of 20kph.'*

Therefore, it is clear that the scheme has focussed on the creation of people friendly streets and spaces. (Planning Report and Statement of Consistency, Thornton O'Connor, June 2022).

The Traffic and Transport Assessment, prepared by Atkins, provides further detail in respect of the compliance of the Proposed Development with this Design Manual.

3.2.3 National Policy Position on Climate Action & Low Carbon Development and the Climate Action Plan

The EU, in 2014, agreed the "2030 Climate and Energy Policy Framework" (EU 2014). The European Council endorsed an EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The Paris Agreement was established in 2015 and is an important milestone in terms of international climate change agreements. In order to meet the objectives of the Paris Agreement, and to assist in reducing Ireland's GHG emissions, the Irish government has established and outlined several policies at a national level.

In 2014, the Government adopted the National Policy Position on Climate Action and Low Carbon Development. The Climate Action and Low Carbon Development Act 2015 was adopted to provide for the approval of plans by the government in relation to climate change. This Act establishes the fundamental national objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. It sets out the context for the objective, clarifies the level of greenhouse gas (GHG) mitigation ambi-

tion envisaged and establishes the process to pursue and achieve the overall objective. Specifically, the Policy Position envisages that policy development will be guided by a long-term vision based on:

- An aggregate reduction in carbon dioxide (CO2) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors; and
- In parallel, an approach to carbon neutrality in the agriculture and land-use sector, including forestry, which does not compromise capacity for sustainable food production.

The National Mitigation Plan (DCCAE, 2017) and the National Adaptation Framework (DCCAE, 2018) were also established under this Act.

In addition, on Thursday 4 November 2021, the government launched the Climate Action Plan 2021, an ambitious plan to put Ireland on a more sustainable path, cutting emissions, creating a cleaner, greener economy and society and protecting us from the devastating consequences of climate change.

The Climate Action Plan follows the Climate Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030. These targets are a key pillar of the Programme for Government. By 2030, the government aims to achieve the following:

- Cutting greenhouse gas emissions by at least 30%
- Reaching a target of at least 32.5% energy efficiency
- Delivering 70% renewable electricity

Typical design solutions that will be assessed for the Proposed Development will include the following:

- Water based heating systems incorporating air source heat pumps or condensing gas boilers;
- Natural ventilation where possible;
- Mechanical ventilation systems incorporating heat recovery and/or heat pump technology;
- Comfort cooling where required with invertor driven, R32 air conditioning technology;
- LED lighting with occupancy and daylight controls; and
- Solar renewable energy systems (photovoltaic or solar thermal) if required to meet renewable contribution energy targets.

The proposed approach to achieving Part L Compliance will be based on a combination of the solutions below once a detailed analysis has been completed at detailed design stage. A final decision will be made once capital costs, renewable targets and regulation compliance have all been compared to find the most appropriate solution.

- Meeting minimum U-Value standards
- Achieve air tightness standards of3m3/m2/hr or lower
- Comply with all ACDs or thermally model all thermal bridging details to achieve thermal bridging factors of less than 0.08W/m2K
- Install high efficiency heat pumps and time and temperature zone control in all houses and apartments

- Install centralised mechanical ventilation systems (either MEV or HRV) to ensure adequate ventilation rates are achieved in the houses and apartments which maximising the benefits of the airtight construction

Further information is available within the Energy Statement Report (Waterman Moylan Consulting Engineers Limited, June 2022. See Appendix B of this EIAR) that is submitted as part of this application.

3.1.3.1 The Planning System & Flood Risk Management (2009)

The Planning System and Flood Risk Management Guidelines were issued under Section 28 of the Planning & Development Act 2000 (as amended). The Planning System and Flood Risk Management Guidelines require the planning system at all levels to avoid development in areas at risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development and where the flood risk can be reduced or managed to an acceptable level without increasing flood risk elsewhere; adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk; and incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

A Site-Specific Flood Risk Assessment (SSFRA) has been prepared in accordance with these guidelines by Roger Mullarkey & Associates (May 2022) and is enclosed with the planning application (See Appendix C of this EIAR).

3.1.3.2 Sustainable Residential Development in Urban Areas, Guidelines for Planning Authorities, 2009 and Urban Design Manual, A Best Practice Guide

The Sustainable Residential Development in Urban Areas guidelines detail the key principles for new residential developments in urban areas while its accompanying Urban Design Manual translates the guidelines into practice. The Guidelines encourage increased densities in appropriate zoned residential land within inner suburban areas of cities, proximate to existing and due to be improved public transport corridors. These guidelines, together with the accompanying best practice Design Manual, provide a sound basis on which planners, designers and developers can translate ideals of sustainable living into a practical reality. They constitute the new gold standard for sustainable residential development in Ireland.

The application site has an area of 11.2 Ha and is located to the north-east of the Enniskerry Road and to the southern side of the Glenamuck Road, with part of its frontage directly opposite Our Lady of the Wayside Church, Kilternan. The Proposed Development site are located 1.9 km to the south-west of the M50 and Carrickmines Retail Park.

The site is located in an established area already well serviced with all necessary infrastructure. The Ballyogan Wood LUAS stop is located 2.3 km – 2.7 km to the north-east (26-31 minutes walk). Access to the M50 Carrickmines (Exit 15) is located 1.9 km from the subject site, a 3 No. minute car journey away. Bus route Nos. 44, 63 and 118 serve the Kilternan and Glenamuck area with direct links to Dublin City Centre and institutions such as Dublin City University in Glasnevin. There are also several proposed new bus routes for Kilternan within the Bus Connects scheme will serve Kilternan Village and offer transport links to Dublin City Centre and other suburbs and employment locations and education facilities in the greater Dublin area such as University College Dublin.

The Proposed Development is a high-quality, sustainable development that achieves the key planning principles and objectives as set out in the County Development Plan and Kilteran Local Area Plan.

3.1.3.2.1 Urban Design Manual (A Best Practice Guide) (2009)

The Urban Design Manual was published as a companion document to the Guidelines for Sustainable Residential Development in Urban Areas. The Manual is intended to assist in the assessment of residential applications, to identify the principles and criteria that are important in the design of housing and to set out a design framework for a new residential neighbourhood. These guidelines are also incorporated in the relevant development plan and/or local area plans and outline key considerations in planning application assessments.

The Manual sets out 12 key urban design criteria that all new residential developments should be tested against, in order to establish if the scheme is a well-designed proposal including Context, Connections, Inclusivity, Variety, Efficiency, Distinctiveness, Layout, Public Realm, Adaptability, Privacy / Amenity, Parking and Detailed Design.

In accordance with the Guidelines, the Proposed Development has been assessed against these criteria by Thornton O' Connor within the Planning Report and Statement of Consistency (June 2022) that is included as part of the planning application.

The Planning Report and Statement of Consistency (Thornton O' Connor, June 2022) concludes that the assessment of the Proposed Development in accordance with the 12 key urban design criteria, and in the context of the expert reports that are submitted as part of this planning application, demonstrates that the proposal is consistent with the guidance as set out in the *Urban Design Manual – A Best Practice Guide (2009*).

3.1.3.3 National Investment Framework for Transport in Ireland (NIFTI) December 2021

The National Investment Framework for Transport in Ireland (NIFTI), published on 21 December 2021, sets out clear principles for the consideration of future transport investment and is closely aligned with key Government policy priorities and commitments, such as the Climate Action Plan and the National Development Plan.

The strategic investment priorities articulated by NIFTI have been developed to support the realisation of the NPF and address key transport challenges identified through extensive supporting analysis. The four NIFTI priorities for future land transport investment are:

- Decarbonisation;
- Protection and Renewal;
- Mobility of People and Goods in Urban Areas; and
- Enhanced Regional and Rural Connectivity.

The Proposed Development aligns with the principles as set out by NIFTI. In particular, the Proposed Development assists in achieving one of the key outcomes of the NPF – Compact Growth. NIFTI Investment Priority: Mobility of People and Goods in Urban Areas' outlines important measures such as '*walking and cycling infrastructure expansion, and the provision of better and more comprehensive public transport services'* in order to tackle spatial constraints and urban congestion issues. The Proposed Development has been designed to encourage

sustainable modes of transport such as cycling and walking through the site. The Neighbourhood Centre will be easily accessible from Enniskerry Road. The scheme also includes 536 No. bicycle parking spaces to encourage cycling to and from the Proposed Development site

"Transport should be a central consideration for future development, reducing the need for new infrastructure and optimising existing transport capacity, mitigating the need to travel and ensuring that the most sustainable modes are encouraged." The subject site is considered eminently suitable for development given the site's location in the heart of Kilternan Village. Permission has been granted for other residential developments in Kilternan and it is considered that the subject site is even more sustainable than some of the granted development sites due to its location in the centre of the village. The area is also serviced by bus route Nos. 44, 63 and 118. The site is also located 1.9 km (20 minutes walking distance) from Carrickmines Retail Park and 2.3 km – 2.7 km to the north-east (26-31 minutes walking distancefrom the Ballyogan Wood Luas Stop (Planning Report and Statement of Consistency, Thornton O'Connor, June 2022).

Therefore, due to the strategic location and good public transport available near the Proposed Development site, the Proposed Development will optimise existing transport services and assists in achieving the NFP and Climate Action Plan key policy objectives and commitments. A Traffic and Transport Assessment (Atkins) has been prepared and is submitted with this planning application. The Traffic Report demonstrate the consistency of the Proposed Development with these policy objectives.

3.1.4 Regional Planning Context

3.1.4.1 Eastern & Midland Regional Assembly - Regional Spatial & Economic Strategy (2019)

The Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031 (hereafter RSES) were adopted in 2019 to ensure the policies and objectives of the NPF are implemented at a regional level.

The Strategy identifies that the Region '*is home to over 800,000 households, with 4 out of 5 living in conventional housing while apartments account for around 18% or our housing stock. One of the challenges facing the Region is the continued growth rates of household formation coupled with a severe slowdown in the development of new housing stock during the economic recession, resulting in housing supply and affordability pressures in both sale and rental markets, particularly in Dublin and urban areas but affecting all of the Region'*.

The RSES sets out an ambitious target to achieve compact growth with 50% of housing to be provided within or contiguous to the built-up area of Dublin city and suburbs.

> **RPO 4.3:** to "*support the consolidation and reintensification of infill / brownfield sites to provide high density and people intensive uses within the existing built up area of Dublin city and suburbs and ensure that the development of future development areas is co-ordinated with the delivery of key water infrastructure and public transport projects."*

The Proposed Development will contribute to the target to achieve compact growth with 50% of housing to be provided within or contiguous to the built-up area of Dublin City and suburbs.

The Proposed Development has been designed in accordance with the above guidelines, objectives of the NPF and the Eastern & Midland Regional Assembly - Regional Spatial & Economic Strategy (2019).

3.1.5 Local Level

3.1.5.1 Dún Laoghaire Rathdown County Development Plan 2022-2028

The Dún Laoghaire Rathdown (DLR) County Development Plan (CDP) is the statutory planning policy document for the County and sets out the policies and objectives for the proper planning and sustainable development of the County from 2022 to 2028. The site is located within the administrative area of Dún Laoghaire Rathdown County Council (DLRCC).

3.1.5.1.1 Requirements for Development of Lands Zoned Objective A' and 'Objective NC'

The entirety of the Proposed Development site is located on land zoned 'Objective A' and 'Objective NC'. The zoning for Objective 'A' includes "*To provide residential development and improve residential amenity while protecting the existing residential amenities*." The zoning for Objective 'NC' is as follows: '*To protect, provide for and/or improve mixed-use neighbourhood centre facilities'*.

Residential use is classed as Permitted in Principle for these Zones therefore the Proposed Development is consistent with the policies and zoning objectives outlined in the CDP. A Neighbourhood Centre including creche, office, medical, retail, convenience retail and a community facility are also proposed as part of the Proposed Development and this also concurs with the relevant NC and Residential zonings. The Proposed Development is fully in accordance with the zoning objectives.

3.1.5.1.2 Policy in relation to Residential Development

Chapter 4 Neighbourhood, People and Homes of the County Development Plan outlines the Plans, Policies and Objectives in accordance with the National Planning Framework (NPF) and the Regional Spatial and Economic Strategy (RSES). In order to achieve compact growth, 50% of housing must be provided for within the built-up area of Dublin City and Suburbs. In order to achieve this goal, the Plan recognises that housing delivery in DLR should accord with the provisions of the Core Strategy which sets out the appropriate locations for future development in DLR.

It is the policy of the CDP to:

PHP6:

Encourage the provision of appropriate childcare facilities as an integral part of proposals for new residential developments and to improve/expand existing childcare facilities across the County. In general, at least one childcare facility should be provided for all new residential developments subject to demographic and geographic needs. Encourage the provision of childcare facilities in a sustainable manner to encourage local economic development and to assist in addressing disadvantage.

PHP9:

Support the Health Service Executive and other statutory and voluntary agencies in the provision and/or improvement of appropriate healthcare facilities - including the system of hospital care and the provision of community-based primary care facilities, mental health and wellbeing facilities. Encourage the integration of appropriate healthcare facilities within new and existing communities.

***PHP18**:*

Increase housing (houses and apartments) supply and promote compact urban growth through the consolidation and re-intensification of infill/brownfield sites having regard to proximity and accessibility considerations, and development management criteria set out in Chapter 12.

Encourage higher residential densities provided that proposals provide for high quality design and ensure a balance between the protection of existing residential amenities and the established character of the surrounding area, with the need to provide for high quality sustainable residential development.

PHO25:

support as appropriate the delivery of the actions set out in the 4 pathways contained in 'Housing for All – A new Housing Plan for Ireland, 2021'.

PHP26:

facilitate the implementation and delivery of the Housing Strategy and Housing Need Demand Assessment (HNDA) 2022 - 2028.

***PHP27**:*

encourage the establishment of sustainable residential communities by ensuring that a wide variety of housing and apartment types, sizes and tenures is provided throughout the County in accordance with the provisions of the Housing Strategy and Housing Need Demand Assessment (HNDA) and any future Regional HNDA.

The Proposed Development supports the polices and objectives as set out in the County Development Plan.

3.1.5.1.3 *Kilternan Local Area Plan 2013-2019* [extended to September 2023] ("*Kilternan LAP")*

The Kilternan LAP outlines 13 no. criteria that planning permission applications in the area must satisfy. These criteria include:

- Conformity with the Kiltiernan / Glenamuck Local Area Plan, 2013-2019 [now extended to 2023], and which promote and facilitate the achievement of its vision and objectives;
- 2. Demonstration of a high level of architectural quality and urban design and are sympathetic to the special character of Kiltiernan / Glenamuck;
- Achievement of local road / footpath improvement and traffic management measures;
- Consolidation of the existing development node at Glenamuck Road (northern section), including 'The Park' development at Carrickmines;
- Consolidation of Kilternan Village;

- Planned within the context of an overall outline Master Plan for individual and affiliated land holdings (in order to prevent piecemeal development);
- Compatibility with later phases of development;
- Facilitation of the orderly development of adjoining property/land holdings;
- Proximity to the Luas Line B1 and within the catchment area for the Section 49 Supplementary Development Contribution Scheme for Luas Line B1;
- Availability of environmental services. Specifically, the Council will monitor and have regard to capacity at the Shanganagh Wastewater Treatment Works to ensure that wastewater from any proposed development in the LAP area can be accommodated in accordance with the Wastewater Discharge License for the Works;
- Incorporation of acceptable Sustainable Drainage System (SUDS) measures on each development site;
- Likelihood of early construction; and
- Provision of an appropriate level of active and passive open space and community facilities. Specifically, the Council, in conjunction with the Department of Education and Skills, will have regard to the capacity of local schools to accommodate development, in accordance with the "Code of Practice on the Provision of Schools and the Planning System"

Further information and justification is provided in the Planning Report and Statement of Consistency, by Thornton O 'Connor (June 2022), however it is concluded that the addition of 383 No. units and Neighbourhood Centre will not give rise to any significant planning difficulties. In addition, the Proposed Development is located within Land Parcels 20A and 22, and the Planning Report demonstrates compliance with the requirements of these land parcels.

3.2 The EIA Directive

The EIA Directive (85/337/EEC) is in force since 1985 and applies to a wide range of defined public and private projects. The EIA Directive was amended in 1997, 2003, 2009, 2011 and 2014 by Directives 97/11/EC; 2003/35/EC, 2009/31/EC, 2011/92/EU and 2014/52/EU. The EIA Directive requires environmental impact assessments to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive, and amendments, are transposed into Irish law through the Planning and Development Acts 1996 to 2019 in particular S.I. No. 296 of 2018.

Schedule 5, Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development.

Schedule 5, Part 2 of the Planning Regulations defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

"Schedule 5, Part 2 - Infrastructure projects

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.)

The Proposed Development does constitute an "urban development" as it is a housing development. According to the Interpretation of Definitions of Project Categories of Annex I and II Document (European Commission, 2015), "*Housing developments, in particular, are frequently included in the 'urban development projects' category*". The total site area of the Proposed Development site comprises an area of 11.153 Ha.

The Proposed Development is not within a "business district" as defined above. Therefore, the two-hectare threshold is not applicable in this case, and the ten-hectare threshold applies instead. As the total site area of the Proposed Development site comprises an area of 11.153 Ha, it is above the 10-hectare threshold for a built-up area and accordingly a mandatory EIAR is required.

In August 2018 the Department of Housing, Planning and Local Government published a document entitled '*Guidelines for Planning Authorities and An Bord Pleanála' on carrying out Environmental Impact Assessment*'. This document has been used in the preparation of this EIAR.

In May 2022, the EPA published the Final "*Guidelines on the information to be contained in Environmental Impact Assessment Reports".* The Guidelines have been updated following the introduction of transposing legislation and are now formally adopted. The preparation of these updated Guidelines has involved extensive consultation. Participants in this consultation included government departments, national agencies, regional and local government, independent statutory bodies, non-governmental organisations, members of the public, developers and bodies representing various professional, industrial and sectoral groups. The Guidelines emphasise the importance of the methods used in the preparation of an EIAR to ensure that the information presented is adequate and relevant. This document has been used in the preparation of this EIAR.

The Revised EIA Directive defines EIA as a process. Article 1(2) (g) states that EIA means:

"(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);

(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;

(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;

(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point

(iii) and, where appropriate, its own supplementary examination; and

(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a".

The Revised EIA Directive requires the EIA to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct and indirect significant effects of the Proposed Development on factors of the environment including:

(a) population and human health;
(b) biodiversity, with particular attention to species and habitats protected under the Habitats and Birds Directives;
(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).

The requirements of the Revised EIA Directive in relation to each Chapter are addressed in the EIAR as follows;

- Chapter 2: Description of Development
- Chapter 3: Planning and Policy Context
- Chapter 4: Population and Human Health
- Chapter 5: Biodiversity;
- Chapter 6: Land and Soils;
- Chapter 7: Hydrology;
- Chapter 8: Air Quality and Climate;
- Chapter 9: Noise and Vibration;
- Chapter 10: Landscape and Visual Amenity;
- Chapter 11: Archaeology and Cultural Heritage;
- Chapter 12: Material Assets including Traffic;
- Chapter 13: Risk Management;
- Chapter 14: Interactions;
- Chapter 15: Mitigation and Monitoring Measures.

4 POPULATION AND HUMAN HEALTH

4.1 Introduction

This Chapter of the EIA Report considers the potential impacts of the Proposed Development on human beings, living, working, and visiting in the vicinity of the application site at Wayside, Enniskerry Road, Kilternan, Dublin 18. The Chapter details the potential direct and indirect effects of the Proposed Development on population and human health.

Human beings are one of the most significant elements of the environment to be considered, therefore any potential impact on the status of humans by a development proposal must be comprehensively addressed. One of the principal concerns in any Proposed Development is that the local population experiences no reduction in the quality of life as a result of the development on either a permanent or temporary basis. This Chapter also examines the socio-economic impacts of the development proposal focusing on pertinent issues such as residential amenity, economic activity, tourism, and population levels.

The section on Population and Human Health is broad ranging and covers the existence, wellbeing, and activities of people through the format of considering people as ‘groups’ or ‘populations’. The assessment of impacts on human beings involves the identification of relevant key populations that may be affected by the Proposed Development and quantifiable documentary research.

Key populations have been identified as persons residing and engaging in activities near the application site, persons with a stake in the general economy of the local and regional area, and persons enjoying the recreational and cultural amenities of the area.

4.1.1 Quality Assurance and Competence

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction Chapters, Population and Human Health Chapters and Archaeology and Cultural Heritage Chapters of EIARs.

4.2 Study Methodology

A desk-based study was undertaken to assess information regarding population, age structure, economic activity, employment, unemployment and travel within the vicinity of the Proposed Development.

The scope of the evaluation is based on a review of data available from the Central Statistics Office (CSO), legislation, guidance documents and EIARs. Consultation was carried out with prescribed bodies to consider the likelihood of significant impacts arising, having regard to the

receiving environment and the nature and extent of the Proposed Development. The aim of the study was to assess the current baseline environment.

The potential impact of the Proposed Development on the local population is assessed in this EIAR in relation to:

- Population;
- Socio Economic impacts;
- Tourism and Amenity;
- Air quality;
- Water;
- Noise;
- Traffic; and
- Risk

4.2.1 Information Sources

The principal sources of information are as follows;

- Census and employment information published by the Central Statistics Office (CSO). Available at https://data.cso.ie/#
- Dún Laoghaire-Rathdown County Development Plan 2022-2028, Available at: https://www.dlrcoco.ie/en/county-development-plan/county-development-plan-2022-2028
- Regional Planning Guidelines of the Greater Dublin Area 2010-2022, and
- Ordinance Survey Ireland (OSI) mapping and aerial photography.

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects. See Table 4-1.

Table 4-1: Definition of Quality of Effects

Quality	Definition
Positive Effects	A change which improves the quality of the environment
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
Negative/adverse Effects	A change which reduces the quality of the environment

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts. See Table 4-2.

Table 4-2: Definition of Significance of Effects

Significance of Effects	Definition
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 Effects	An effect which causes noticeable changes in the character of the environment without affecting 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	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 Effects	An effect which obliterates sensitive characteristics

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects. See Table 4-3.

Table 4-3: Definition of Duration of Effects

Quality	Definition
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term Effects	Effects lasting fifteen to sixty years
Permanent Effects	Effects lasting over sixty years
Reversible Effects	Effects that can be undone, for example through remediation or restoration

4.3 The Existing and Receiving Environment (Baseline Situation)

The total red line application site boundary is 11.2 Ha with a developable site area of 10.8 Ha and is located at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18. The site is generally bounded by the Glenamuck Road to the north; Kilternan Country Market and the Sancta Maria property to the north and west; a recently constructed residential development named "Rockville" to the north-east; the Enniskerry Road to the south-west; dwellings to the south; and lands that will facilitate the future Glenamuck Link Distributor Road

to the east. The lands are located 1.9 km to the south-west of the M50 and Carrickmines Retail Park.

Phase 2 of "Rockville" has been granted permission, and it is planned to link the Proposed Development into Rockville. The future Glenamuck Link Distributor Road is part of the Glenamuck District Roads Scheme (GDRS), which relates to road proposals servicing the Carrickmines area between the Enniskerry Road and the Glenamuck Road. The scheme has been granted permission by An Bord Pleanála and preliminary site work on the Glenamuck District Road Scheme is nearing completion bringing the Design Stage to a conclusion. Subject to a successful contractor procurement process, it is expected that a contractor will start in Q3 of 2022. The overall construction period is estimated at 2 years, but Dún Laoghaire-Rathdown County Council (DLRCC) intend that the East-West Road (Stepaside to Carrickmines) should be available to public traffic within about 12 months of commencement. This will provide significant relief for the Glenamuck Road.

4.3.1 Population and Demographic Analysis

In terms of the County, Region and the State, population structure and change are more strongly influenced by migration and emigration rates than by birth and death rates. The mid to late 1980s in Ireland was a period of heavy population outflow, mainly due to the poor economic and employment situation in the country at that time. The most recent population estimates (2016 Census data published in April 2017) published by the Central Statistics Office indicate that the combination of a net inward migration and high birth rates have resulted in the largest annual population increase since 2008. Population projections for Ireland up to 2046 anticipate a population of approximately five million under the most pessimistic scenario and over 6.7 million under the most optimistic scenario. Population projections for Northern Ireland up to 2034 anticipate a population of approximately two million.

The study area for the purposes of the demographic analysis comprises of the Glencullen Electoral Division (ED) which contains the town of Kilternan and the Site of the Proposed Development. The following section will provide a socio-economic profile of the study area, including insight with respect to the population's age profile, educational attainment, and economic status, to better understand the needs of the population regarding social services and facilities.

Table 4-4 shows populations of the Glencullen ED and Dun Laoghaire-Rathdown County (DLRC) as recorded during the 2011 and 2016 Census, as well as the percentage change in population during this period to highlight overall residential patterns.

Table 4-4: Population Change in Glencullen ED and DLR County, 2011 to 2016 Census (Source: CSO 2016)

Area	Population 2011 Census Date	Population 2016 Census Data	Change in Number of Persons	Percentage change in Population
Electoral Division	17,381	19,773	2392	13.7%
DLRC	206,261	218,018	11,757	5%

As per Table 4-4, the Electoral Division of Glencullen has experienced a population increase of 13.7% between 2011 and 2016. This is more than double the increase recorded for DLR County, which increased by 5%.

4.3.2 Population and Age

The social and community needs are assessed based on consideration of the existing and potential population growth and best practice provision. CSO data for 2016 recorded a total of 19,773 people live in the Electoral Division within which the Site of the Proposed Development is located. Within DLRC there are 218,018 persons and within Dublin City and County there are 1,347,359 persons.

Table 4-5 shows the breakdown of the population of Electoral Division and DLR County based on their age range during the 2016 Census. Different age cohorts of population have different requirements, with young families in need of childcare and educational facilities. Therefore, it is imperative to understand the changes within the specific age cohorts to plan for the future.

Table 4-5: Glencullen ED and State Population by Age 2016 Census (CSO 2016)

Age Range	Electoral Division		Ireland	
	No. of People	% of People	No. of People	% of People
0-4 years	1781	9.0	331515	7.0
5-12 years	2621	13.3	548693	11.5
13-18 years	1773	9.0	371588	7.8
19-24 years	1341	6.8	331208	7.0
25-44 years	6963	35.2	1406291	29.5
45-64 years	4066	20.6	1135003	23.8
65 and over	1228	6.3	637567	13.4
Total	**19,733**		**4,761,865**	

As evident from Table 4-5 the population of the Electoral Division has a much lower percentage of people aged over 65 when compared with the State values (6.3% versus 13.4% respectively). In the ED, the largest portion of the population is aged 23-44 with 35.2% which is higher than the State value of 29.5%. The percentage of the population ranging from 19-24 years is 6.8% and 45-64 years is 20.6%. These figures are lower than the State values of 7.0% and 23.8% respectively.

Children aged 0-4 years make up 9.0% of the ED compared with the lower figure of 7.0% of the State values.

4.3.3 Economic Activity & Employment

The labour force is defined by number of people above the legal working age that are available to work. The labour force participation rate is the number of people who are employed and unemployed but looking for a job, divided by the total working-age population.

In 2016, there were 2,304,037 persons in the labour force in Ireland. This represented an increase of 71,834 (3.2%) on 2011 statistics. The substantial increase in retired persons (up 19.2% to 545,407) has impacted on the labour force participation rate, which fell to 61.4%.

Table 4-6 shows the percentage of the total population aged 15+ who were in the labour force during the 2016 Census in DLR County and the State. This figure is further broken down into the percentages that were at work, looking for first regular job or unemployed. It also shows the percentage of the total population aged 15+ who were students, retired, unable to work or performing home duties.

Table 4-6: Economic Status of the Population Aged 15+ in 2016 (Source: CSO 2016)

Status		**DLR**		**Ireland**	
% of population aged 15+ who are in the labour force		**No. of People**	**% of People**	**No. of People**	**% of People**
% of which are	At work	95,793	53.8	2,001,953	53.3
	Unemployed looking for first regular job	927	0.5	31,434	0.8
	Unemployed having lost or given up previous job	6789	3.8	265,962	7.1
	Assisting relative	132	0.1	4,688	0.1
Total population aged 15+ who are in the labour force		**103,641**	**58.2**	**2,304,037**	**61.4**
% of population aged 15+ who are not in the labour force		**No. of People**	**% of People**	**No. of People**	**% of People**
% of which are	Student or pupil	25644.00	14.4	427,128	11.4
	Looking after home/family	13801.00	7.7	305,556	8.1
	Retired	30339.00	17.1	545,407	14.5
	Unable to work due to permanent sickness or disability	4071.00	2.3	158,348	4.2
	Other economic status	483.00	0.3	14,837	0.4
Total of population aged 15+ who are not in the labour force		**74338.00**	**41.8**	**1,451,276**	**38.6**

When assessing the percentage of people categorised 'At Work' in 2016, it is noted that the economic profile of DLR is similar to the State values and reflects a high number of people of a working profile living within the area. The percentage of people who are 'at work' in the ED is 53.8% which is very close to the State value of 53.3%.

The percentage of people who are Unemployed looking for first regular job in the DLR County is 0.5% which is close to the State value of 0.8%. However, the percentage of people Unemployed having lost or given up previous job of 3.8% for the DLR County is significantly lower than the State value of 7.1%.

The percentage of people in the DLR County that are unable to work due to permanent sickness or disability is 2.3% which is lower than the percentage for the State of 4.2%. The percentage of people who are 'Retired' in the DLR County area is 17.1% which is higher than the State values of 14.5%.

Overall, the breakdown of people in the workforce in the DLR County area is comparable to the State averages.

Table 4-7 details the most recent publication of monthly unemployment statistics issued by the CSO in June 2022 for the reference month May 2022. The monthly unemployment release contains a series of monthly unemployment rates and volumes. These series are based primarily on the Labour Force Survey and are compiled in accordance with agreed international practice. These statistics are the definitive measure of monthly unemployment. The Live Register is used to provide a monthly series of the numbers of people (with some exceptions) registering for Jobseekers Benefit or Jobseekers Allowance or for various other statutory entitlements at local offices of the Department of Social Protection. The Dun-Laoghaire social welfare office is the nearest welfare office to the Proposed Development and covers the Kilternan area.

Table 4-7: Number of People on Live Register in DLRC (Source: CSO)

Live Register	May 2022	April 2022	March 2022	February 2022	January 2022	December 2022
Number of Persons	3597	3634	3641	3199	3231	3228

Employment in professional, scientific, and technical activities; financial and insurance activities; human health and social work activities; wholesale and retail trade; repair of motor vehicles and motorcycles is the most prevalent broad industrial areas of employment in DLR Council Area as detailed in Table 4-8. Education and information and communication are also predominant areas of employment in DLR Council. Table 4-8 also shows that 927 people in the DLRC Area are unemployed looking for first regular job and 6,789 are unemployed, having lost or given up previous job.

Table 4-8: Population Aged 15+ in the Labour Force DLRC Area by Broad Industrial Group (Source CSO 2016)

Broad Industrial Group	No. of People
Professional, scientific and technical activities	11232
Financial and insurance activities	10934
Human health and social work activities	10355
Wholesale and retail trade; repair of motor vehicles and motorcycles	10244
Education	9661
Information and communication	9257
Unemployed, having lost or given up previous job	6789
Industry not stated	5623
Manufacturing	4975
Public administration and defence; compulsory social security	4054
Accommodation and food service activities	3785
Administrative and support service activities	3624
Construction	2939
Arts, entertainment, and recreation	2300
Transportation and storage	2192
Other service activities	1898
Real estate activities	1022
Unemployed looking for first regular job	927
Electricity, gas, steam and air conditioning supply	910
Water supply; sewerage, waste management and remediation activities	241
Activities of households as employers producing activities of households for own use	240
Agriculture, forestry and fishing	225
Activities of extraterritorial organisations and bodies	159
Mining and quarrying	55
Total in labour force	**103,641**

As with employment, the number of persons in the labour force is also influenced by changes in the size of the working age population (demographic effect). Up to the start of 2008 this demographic effect had been adding at least 30,000 to the labour force, nationally, on an annual basis, primarily driven by net inward migration. The decline in inward migration saw the positive demographic effect starting to fall in the second half of 2007. Inward migration continued to decline throughout 2008 and 2009 before becoming negative in Q3 2009. The negative demographic effect continued for each quarter until Q1 2014. The demographic effect

has been positive since Q2 2014 and in Q1 2019 a positive demographic effect contributed an increase of 36,000 to the overall change in the labour force nationally.

The Proposed Development will allow for the creation of direct employment. It is proposed that approximately 100 jobs will be created during the peak of the Construction phase having a positive impact, both directly and indirectly to the local economy and employment.

As the end users of the Operational Phase are currently unknown staffing numbers are difficult to predict. Values have been estimated for staff as per the below guidance from DLR Standards for Cycle Parking for New Developments Guidance (2018) (Section 4.2);

"*where the number of staff is not known at planning application stage, the following can be used as a guide*:

- *Office type uses 20 m^2 per staff member*
- *Warehousing or small industry type uses 50 m^2 per staff member*
- *All other uses including retail 40 m^2 per staff member*"

Based on these guidelines, approximately 63 jobs will be created during the Operational Phase of the Proposed Development.

4.3.4 Travel and Commuting

4.3.4.1 Glencullen Electoral Divsion

An assessment of commuter duration and commuter times are summarised for the Glencullen ED in Tables 4-9 and 4-10.

A total of 2524 people (17.8%) commute to work or school for a duration less than 15 minutes. In total 48.26% of people spend less than 30 minutes commuting to work or school. The remaining 37.04% people spend between 30- 60 minutes commuting to work or school and 9.21% of people spend 1 hour or more commuting to work, school or college (Table 4-9)

Table 4-9: Duration of Commute from Glencullen ED (Source CSO Census 2016)

Duration of Travel Times	No. of People (Total)	Percentage %
< ¼ hour	2,524	17.80
¼ hour - < ½ hour	4,319	30.46
½ hour - < ¾ hour	3,796	26.77
¾ hour - < 1 hour	1,457	10.27
1 hour - < 1½ hours	1,144	8.07
1½ hours and over	161	1.14
Not stated	7,152	5.50
Total	**14181**	

Almost one quarter of people (23.19% of people) leave home to travel to school or work between 8:00 and 08:30. The majority of people (47.38% of people) leave home before 08:00.

A further 2,092 people (14.75% of people) leave home between 08:31 and 09:00. A total of 10.42% of people leave home after 09:00.

Table 4-10: Time Leaving Home Glencullen ED (Source CSO Census 2016)

Time of Travel	No. of People (Total)	Percentage of People
Before 06:30	468	3.30
06:30 - 07:00	985	6.95
07:01 - 07:30	1,977	13.94
07:31 - 08:00	3,289	23.19
08:01 - 08:30	3,357	23.67
08:31 - 09:00	2,092	14.75
09:01 - 09:30	618	4.36
After 09:30	860	6.06
Not Stated	535	3.77
Total	**14181**	
*Excludes those who work mainly at or from home		

Table 4-11 shows the means of transport in the Glencullen ED. A total of 802 people (5.53%) travel by foot and 443 people (3.05%) by bicycle. A total of 58.24% travel by motor car, either as a driver (38.09%) or as a passenger (20.15%). An additional 935 people travel by bus, minibus, or coach and 2,752 by Train, DART or LUAS.

The most popular means of transport in the ED is travel by car as a driver or a passenger.

Table 4-11: Means of Travel from Glencullen ED (Source CSO Census 2016)

Means of Travel	All persons	Percentage of People
On Foot	802	5.53
Bicycle	443	3.05
Bus, minibus or coach	935	6.45
Train, DART or LUAS	2,752	18.98
Motorcycle or scooter	62	0.43
Car Driver	5,524	38.09
Car passenger	2,922	20.15
Van	253	1.74
Other (incl. lorry)	23	0.16
Work mainly at or from home	322	2.22
Not stated	465	3.21
Total	**14503**	

4.3.4.2 Dun-Laoghaire Rathdown County Council Area

The CSO data presented in Section 4.3.4.1 for Travel and Commuting relating to the Glencullen Electoral Division does not contain a breakdown of age profiles. Tables 4-12 to 4-14 detail age breakdowns for duration of commute, time leaving home and means of travel.

Table 4-12: Duration of Commute from DLRC (Source CSO Census 2016)

Duration of Travel Times	No. of People (Total)	Percentage of People (total)	No. of People aged 15 years and over at work	No. of Children at school aged between 5 and 12 years	No. of Students at school or college aged between 13 and 18 years	No. of Students at school or college aged 19 years and over
< ¼ hour	30,184	21.6	12,588	11,780	3,813	2,003
¼ hour - < ½ hour	43,058	30.9	26,727	6,698	5,967	3,666
½ hour - < ¾ hour	34,683	24.8	26,464	1,450	3,136	3,633
¾ hour - < 1 hour	13,687	9.8	11,288	177	669	1,553
1 hour - < 1½ hours	9,248	6.6	7,481	130	265	1,372
1½ hours and over	1,560	1.1	1,092	35	43	390
Not stated	7,152	5.1	5,180	865	608	499

Table 4-13: Time Leaving Home DLR Council Area (Source CSO Census 2016)

Time of Travel	No. of People (Total)	Percentage of People (total)	No. of People aged 15 years and over at work	No. of Children at school aged between 5 and 12 years	No. of Students at school or college aged between 13 and 18 years	No. of Students at school or college aged 19 years and over
Before 06:30	4,567	3.3	4,445	9	13	100
06:30 - 07:00	9,163	6.6	8,542	79	156	386
07:01 - 07:30	16,268	11.7	13,495	460	1,485	828
07:31 - 08:00	28,645	20.5	19,351	2,261	5,262	1,771
08:01 - 08:30	36,138	25.9	18,599	8,910	5,800	2,829
08:31 - 09:00	23,279	16.7	10,708	8,610	1,220	2,741
09:01 - 09:30	6,339	4.5	4,565	224	107	1,443
After 09:30	10,519	7.5	7,651	12	140	2,716
Not stated	4,654	3.3	3,464	570	318	302
*Excludes those who work mainly at or from home						

Table 4-14: Means of Travel from DLR Council Area (Source CSO Census 2016)

Means of Travel	No. of People (Total)	Percentage of People (total)	No. of Children at school aged between 5 and 12 years	No. of People aged 15 years and over at work	No. of Students at school or college aged between 13 and 18 years	No. of Students at school or college aged 19 years and over
Bicycle	8,864	6.2	677	5,795	885	1,507
Bus, minibus or coach	15,180	10.6	643	7,812	3,069	3,656
Motor car: Driver	50,021	34.8	-	47,753	186	2,082
Motor car: Passenger	20,614	14.4	12,489	2,160	5,441	524
Motorcycle or scooter	861	0.6	-	812	7	42
Not stated	4,139	2.9	602	2,991	303	243
On foot	18,387	12.8	6,411	6,858	2,710	2,408
Other, incl. lorry	181	0.1	4	172	2	3
Train, DART or LUAS	19,040	13.3	287	14,215	1,892	2,646
Van	2,285	1.6	22	2,252	6	5
Work mainly at or from home	4,003	2.8	14	3,930	14	45
Total	**143,575**		**21,149**	**94,750**	**14,515**	**13,161**

4.3.5 Tourism and Amenities

Tourism is one of the most important indigenous economic sectors in the County, the Region and the State. Kilternan is in close proximity to a number of tourism and community amenities. There are a range of walking and hiking trails nearby such as Carrickgollogan Forest Trail, Scalp Viewing Point, Barnaslingan Forest, Ticknock Halt and Three Rock. The area also features a number of attractive gardens for tourists and visitors to the area such as Knockrose Garden, Powerscourt House & Gardens and Knocksink Wood Nature Reserve Education Centre. The area surrounding the Proposed Development also features a number of outdoor attractions. The Glencullen Adventure Park is bike park situated in the Dublin / Wicklow Mountain border which also offers free scenic walking trails which lead to Ticknock and the Dublin and Wicklow Mountain Way. The Dun Laoghaire Golf Club, Carrickmines Golf Club and Stepaside Golf Club are all within a 10-minute drive of Kilternan. The Carrickmines Equestrian Centre is located a 5-minute drive from Kilternan and offers a tranquil setting for visitors and tourists to enjoy treks and horse riding. Skirmish Paintball is located a 5-minute drive from Kilternan and features a 65-acre forest with 6 purpose-built paintball game areas providing a great paintballing experience for groups of all sizes. The Ski Club of Ireland is based in Kilternan, Co. Dublin, where it operates the National Snowsports Centre for Ireland. People from all over Ireland and abroad come to the facility every year to learn or develop

their skiing or snowboarding skills and enjoy the many activities at the club throughout the season.

Kiltiernan is also located approximately 13km from Dublin city. Dublin City has a range of community facilities including parks / open spaces, sports / recreational, playgrounds, youth centres and libraries. Dublin is a vibrant and cosmopolitan city. The medieval city has an abundance of tourist attractions and offers tourists an opportunity to experience historical attractions, sporting events, cultural life, parks and walks of the coastline. Some popular tourist attractions include The Guinness Storehouse, The Book of Kells and Trinity College, Dublin Castle, St Patrick's and Christ Church Cathedrals, Dublin Zoo as well as various galleries, Dublin Bay cruises and walks. Some popular city parks include St Stephen's Green, Phoenix Park, St. Annes Park, Iveagh Gardens, Dubh Linn Gardens, Garden of Remembrance. The numerous cultural and man-made attractions are easy to access via national roads, airports, and ports.

Tourism and recreation make a positive contribution to the economic and social wellbeing of Dublin City and County. Dublin welcomed 7.7 million tourists in 2018 and received €2,395 million in tourist spend during the same period. Fáilte Ireland, the national tourism development authority, aims to guide and promote tourism as a leading indigenous component of the Irish economy.

Due to the location of the Site of the Proposed Development it is not considered to be of importance to tourism. A full assessment of the potential impact of the Proposed Development on heritage sites and surrounding areas is carried out under Chapter 10 (Landscape and Visual) and Chapter 11 (Archaeology and Cultural Heritage) of this EIAR.

4.3.6 Landscape and Visual

Under the Dún Laoghaire-Rathdown County Development Plan (DLRCDP) 2022-2028 (Dún Laoghaire-Rathdown County, April 2022), the lands across the north and east of the Site of the Proposed Development are zoned '*Objective A – To provide residential development and improve residential amenity while protecting the existing residential amenities*', while the lands to the west of the Site are zoned '*Objective NC – to protect, provide for and/or improve mixed-use neighbourhood centre facilities*'.

'Rockville' is a protected structure within the study area. According to the Final Planning Report and Statement of Consistency prepared by Thornton O'Connor (*June 2022*), '*In relation to the Rockville Protected Structure, there is a 4 No. storey block already existing between the subject lands and the Protected Structure (located in the neighbouring development on the boundary with the subject lands). Sufficient separation distances are provided from the boundary with the neighbouring Rockville development.*' There are no other Preserved / Protected Views, Protected Areas, or Protected Structures within the study area.

4.3.7 Human Health

Health, as defined by the World Health Organization (WHO), is "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*". The Healthy Ireland Framework 2013-2025 defines health as '*everyone achieving his or her potential to*

enjoy complete physical, mental and social wellbeing. Healthy people contribute to the health and quality of the society in which they live, work and play'. This framework also states that health is much more than an absence of disease or disability, and that individual health, and the health of a country affects the quality of everyone's lived experience.

Health is an essential resource for everyday life, a public good and an asset for health and human development. A healthy population is a major asset for society and improving the health and wellbeing of the nation is a priority for Government. Healthy Ireland Framework 2013-2025 is a collective response to the challenges facing Ireland's future health and wellbeing.

Table 4-15: Health Status of Glencullen ED (Source: CSO)

General Health	No. Of People	% of People
General health - Very good	13676	69.2
General health - Good	4251	21.5
General health - Fair	868	4.4
General health - Bad	144	0.7
General health - Very Bad	39	0.2
Not stated	795	4.0
Total	**19773**	

Table 4-15 shows that 90.7% of people in Glencullen ED have self-identified themselves in the 2016 Census as having 'very good health' or 'good health'.

Irelands society continues to adhere to the public health advise. All public health advise that will be in place, at the time of commencement of the construction and operational phases of the Proposed Development, will be adhered to protect human and public health.

4.3.8 Social Health

According to the World Health Organisation, poor social and economic circumstances affect health throughout life. Good health involves reducing levels of educational failure, reducing insecurity and unemployment, and improving housing standards.

Health is influenced, either positively or negatively, by a variety of factors. Some of these factors are genetic or biological and are relatively fixed. '*Social determinants of health*' arise from the social and economic conditions in which people live. They are not so fixed such as type of housing and environments, access to health or education services, incomes generated and the type of work people do, can all influence a person's health, and the lifestyle decisions people make.

A range of factors have been identified as social determinants of health, these generally include the wider socio-economic context, inequality, poverty, social exclusion, socio-economic position, income, public policies, health services, employment, education, housing,

transport, the built environment, health behaviours or lifestyles, social and community support networks and stress.

People who are less well off or who belong to socially excluded groups tend to fare badly in relation to these social determinants. Being at work on the other hand provides not only an income, but also access to social networks, a sense of identity and opportunities for development or progression.

Figure 4-1 presents the social determinants of health adapted from Dalghren and Whitehead (1991) and Grant and Barton (2006) as presented in Healthy Ireland.

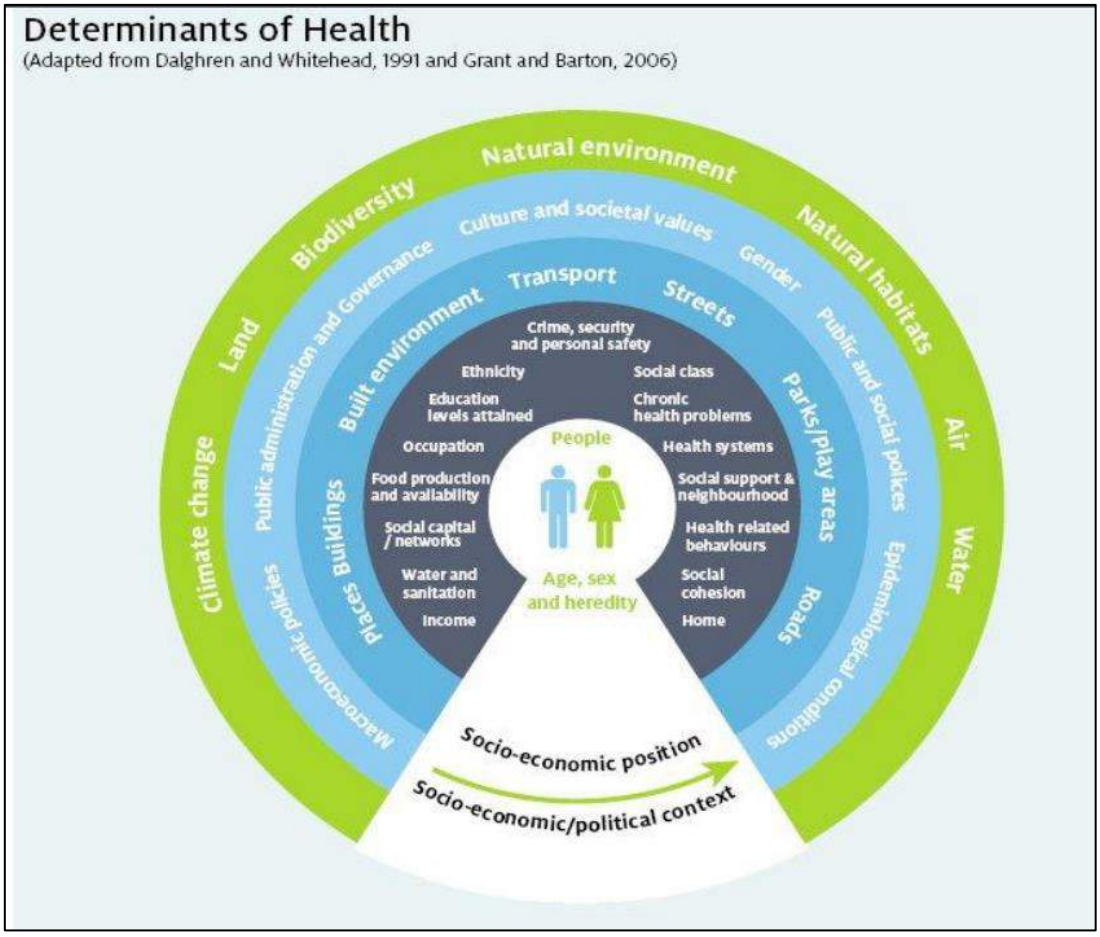

Figure 4-1: Social Determinants of Health (Healthy Ireland, DOH 2013)

Section 4.3.3 of this Chapter states 58.2% of the population in the DLR Council area are in the labour force. This reflects the high number of people of a working profile living within the area. This is

The percentage of people working (employer or own account worker, employee and looking after home/family) is 63% for the Study Area, which is higher than the percentage for the County.

The Proposed Development will allow for the creation of new employment. It is proposed an approximately 100 no. jobs will be created during the peak Construction Phase and 63 no.

jobs will be created during the Operational Phase of this development having both a direct and indirect positive impact on the local economy and employment.

As detailed in Table 4-15, the majority of people in the DLR Council (90%) have self-identified themselves in the 2016 Census as having 'very good health' or 'good health'. The high employment levels, coupled with the self-identification of health status in the DLR Council, indicating that positive social health conditions exist.

4.4 Characteristics of the Proposed Development

In summary, the Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

4.4.1 Construction Phase

The construction of the Proposed Development is intended to take place in five phases (Phase 1, 2, 3, 4 and 5) starting from the Central Western portion of the site moving in an anti-clockwise direction through Phase 2 to the East and Phase 3 to the North. The southern two sections of the site will be completed next, starting in the south-eastern corner of the site (Phase 4) and moving south westerly to Phase 5. The proposed sequence of construction outlined below is subject to confirmation once the building contract has been awarded and on completion of the Detailed Construction Management Plan for agreement with the relevant Local Authority. The overall duration of the project is estimated to be 5 no. years in total, with some phases overlapping.

The sequencing of the five phases of the Proposed Development is intended to proceed as follows:

- Phase 1 (18 months) – Central Western portion of the site consisting of 91 residential units (made up of houses and duplexes), all associated landscaping works and drainage for Phase 1. The Main Public Open Space, Central Green Way Link, Dingle Way and off-site drainage through southern lands. Access to Glenamuck Link Distributor Road (GLDR) will also be formed in this phase (if the GLDR is in place).
- Phase 2 and Phase 2A (24 months) – Central Eastern portion of the site and the Neighbourhood Centre consisting of 126 residential units (73 in Phase 2 and 53 in Phase 2A) made up of houses, duplexes, and apartments along with all associated landscaping works. The main drainage for Phase 2 and the Neighbourhood Centre will be completed. Access to GLDR will be constructed if not completed in Phase 1.
- Phase 3 (12 months) – North-eastern portion of the site consisting of 59 residential units made up of apartments, with all associated landscaping works, along with the creation of a new access to Glenamuck Road and drainage for Phase 3.

- Phase 4 (18 months) – South-eastern portion of the site consisting of 97 residential units made up of apartments, with all associated landscaping works and drainage for Phase 4.
- Phase 5 (8 months) – South-western portion of the site consisting of 10 residential units made up of apartments, with all associated landscaping work and drainage for Phase 5.

4.4.2 Operational Phase

The Operational Phase of the Proposed Development will consist of the normal day-to-day operations necessary for the management of a mixed-use residential development including a creche, office, medical, retail, convenience retail and community facility.

4.5 Potential Impact of the Proposed Development

The population in the vicinity of the Site of the Proposed Development has been assessed in terms of demography, economic activity and employment, tourism and amenity, travel, landscape and visual, human health and social health.

'Environmental factors play a central role in human development, health and disease. Broadly defined, the environment, including infectious agents, is one of three primary factors that affect human health. The other two are genetic factors and personal behaviour. As the impact of the environment on human health is so great, protecting the environment has long been a mainstay of public health practice. National and local efforts to ensure clean air and safe supplies of food and water, to manage sewage and municipal wastes, and to control or eliminate vector-borne illnesses have contributed a great deal to improvements in public health' (Centre for Environmental Research, 2010).

The Proposed Development has the potential to provide employment opportunities and health improvements. Employment and income are among the most significant determinants of long-term health, influencing a range of factors including the quality of housing, education, diet, lifestyle, coping skills, access to services and social networks. The provision of a mixed-use development including 383 no. residential units will contribute towards easing the housing crisis in Ireland, population increase will support the local economy and a proposed Neighbourhood Centre, which will provide a creche, office, medical, retail and convenience retail during the Operational Phase will result in approximately 63 no. jobs being created.

Therefore, the Proposed Development will have a significant positive effect on Population and Human Health in terms of additional direct and indirect employment and on the local socio-economic environment.

4.5.1 Construction Phase

The Proposed Development has the potential to cause additional traffic, air emissions from increased traffic, dust, noise, or visual impacts. Each of these impacts has been assessed in full in the respective Chapters of this EIAR - Chapter 8 (Air Quality), Chapter 9 (Noise and Vibration), Chapter 10 (Landscape and Visual Amenity) and Traffic (Chapter 12.1). The impact of these on the population or human health during the Construction Phase will be negative, significant, and short-term in duration.

4.5.1.1 Socio-economic

The Proposed Development will allow for the creation of direct employment. There will be approximately 100 workers employed during the peak of the Construction Phase of the project. The Proposed Development will also create additional indirect employment for suppliers, drivers delivering supplies to and from the Site and workers on the Site utilising local shops and other businesses in the surrounding areas which will benefit the local economy. Therefore, the Proposed Development will have a significant positive effect in terms of additional direct and indirect employment and on the local socio-economic environment and will be short-term in duration.

4.5.1.2 Human Health

The Proposed Development has the potential to provide health improvements due to the creation of additional employment and supply of housing in Kilternan and the Greater Dublin Area. Employment and income are among the most significant determinants of long-term health. It is anticipated that approximately 100 no. construction personnel will be employed during the Construction Phase which is anticipated to extend over a period of approximately 5 years. This will be a positive, short-term impact due to the creation direct and indirect employment during the Construction Phase.

The Proposed Development has the potential to result in the spread of COVID-19 if social distancing and hygiene measures are not adhered to at the facility. During the Construction Phase of this Proposed Development any HSE guidelines in place at the time in relation to social distancing, cough and sneeze etiquette, face masks and hand washing will be adhered to. If all COVID-19 safety protocols and hygiene measures are adhered to it is considered that the development poses no additional COVID-19 risk.

4.5.1.3 Hydrology

During the Construction Phase there is potential for demolition and excavation works to impact ground water and surface water quality. Surface runoff will be managed during the Construction Phase of the Proposed Development and there will be no direct discharge to groundwater or surface water. However, in the event of a rainfall event, surface runoff with suspended solids or other potentially deleterious materials could enter the receiving drainage channels on lands adjoining the Proposed Development Site. There is also a potential risk associated with the cementitious materials used during the construction of foundations, pavements and other structures impacting on the underlying groundwater at the Proposed Development Site.

The mitigation measures outlined in Chapter 7 Hydrology of this EIAR combined with the mitigation measures within the Construction Environmental Management Plan (CEMP) (Enviroguide, May 2022) will ensure that there will be no significant impact on the receiving groundwater and surface water environment. This will ensure there will be significant impact on population and human health and the surrounding hydrology and water quality as a result of the Construction Phase of the development.

4.5.1.4 Air Quality and Climate

Nuisance dust emissions from construction activities are a common and well recognised problem which can negatively impact air quality. Fine particles from these sources are recognised as a potential significant cause of pollution and can be damaging to the health of the surrounding population during the Construction Phase. A series of mitigation and control measures are described in Chapter 8 Air Quality and the Construction Management Plan to ensure there is no significant impact as result of dust (Atkins, May 2022).

4.5.1.5 Noise and Vibrations

Noise generating activities associated with the Construction Phase have been identified in Chapter 9 Noise and Vibrations of this EIAR. During the Construction Phase all operations will comply with the BS5228:2009 “Noise and Vibration Control on Construction and Open Sites”. The noise-generating activities associated with the Site are as follows:

- Extraction works, including site clearing and earthworks required to prepare the site for building foundations and installing utility services;
- Development construction works;
- Trucks entering and exiting the facility.

The nearest noise sensitive locations in relation to population and human health are residential properties which are located approximately 30m - 40m from the Proposed Development Site Boundary. Noise from onsite plant and equipment has been assessed in Chapter 9 Noise and Vibrations and it is not envisaged that any excessively noisy activities will be carried out over extended periods of time during the construction stage. Hedgerows on the intervening lands between the Site Boundary and the nearby residential dwellings coupled with mitigation measures in Chapter 9 of this EIAR report and the Construction Management Plan (CMP) (Atkins June 2022) will ensure there will be no significant impacts on population and human health. Any impacts will be negative and short-term in duration.

The hours of construction are outlined within the CMP. Typical working hours for the site will be subject to the condition of the planning permission but are expected to be Monday to Friday from 7am to 7pm and Saturdays from 7am to 2pm. Special construction operations may need to be carried out outside these hours to minimise disruption to the surrounding area, which will be subject to agreement with the Local Authority. No activities will be permitted onsite outside of these hours unless by prior agreement with the Local Authority. These set working hours will minimise the short term noise impacts on the surrounding population.

4.5.1.6 Landscape and Visual Impact

During the Construction Phase the Site landscape will undergo a change which will have a visual impact. This will potentially impact on the visual amenity of the nearby visual receptors. These landscape impacts will reduce rapidly with distance from the site boundaries, and intervening hedgerows, open park spaces, and existing buildings will further reduce the impacts to minor to negligible, negative and short term for the Construction Phase.

It is concluded that the Proposed Development will, therefore, have a minor, negative and short to medium-term impact on the landscape character of the Site during the Construction Phase.

4.5.1.7 Traffic

Construction activities have the potential to negatively impact the surrounding road network through increased traffic. The Outline Construction Traffic Management Plan (Atkins, May 2022) details a series of control measures to ensure any potential impacts on the adjacent local and strategic road network are minimised. Construction vehicles and HGVs will be restricted to using only the approved means of access and movement of construction vehicles will be restricted to the designated routes within the Outline Construction Traffic Management Plan. HGV movements will be restricted during peak AM and PM hours to minimise any disruption to the nearby schools. The likely traffic impact of the construction works will be negative and short-term in nature.

4.5.2 Operational Phase

4.5.2.1 Socio-Economic

The Proposed Development will allow for the creation of new employment in the creche, office, medical and retail units. It is proposed that approximately 63 no. people will be directly employed during the operational phase having a positive impact, both directly and indirectly to the local economy and employment.

The Proposed Development will provide 383 no. residential units and will cater for a wide cohort of persons including families, older persons and young couples who will utilise existing services and amenities in the local area which will ultimately be a positive impact on the local economy. The Proposed Development will also create jobs such as within the Neighbourhood Centre, which will provide a creche, office, medical, retail and convenience retail, which would all result in additional employment opportunities being facilitated during the Operation Phase of the Proposed Development. Therefore, the Proposed Development will benefit the local economy of Kilternan Village as a result of the increase in population at the site, as they will bring significantly increased spending power into the local economy and create a stronger and more vibrant community in the centre of Kilternan.

In addition, a Neighbourhood Centre, which as well as benefiting the future residents, it will also cater for the immediate existing residents of the area, and thus will enhance the amenity of the area. The development will have economic benefits such as positive effect in terms generating economic activity with spin-off economic activity created for local retail and service providers. This would have a minor positive socio-economic effect.

4.5.2.2 Human Health

The Proposed Development has the potential to provide health improvements due to the creation of additional employment. Employment and income are among the most significant determinants of long-term health. This will be a positive impact due to the creation of approximately 63 no. jobs during the operational phase. The provision of new housing units in the area will also help to alleviate the national housing shortage by supplying 383 no residential dwellings.

The Proposed Development may result in the spread of COVID-19 if social distancing and hygiene measures are not adhered to at the facility during the operational phase. During the operational phase of this Proposed Development HSE guidelines will be adhered to in relation

to social distancing, cough and sneeze etiquette, face masks and hand washing. Appropriate welfare facilities will be provided at the facility.

If all COVID-19 safety protocols and hygiene measures are adhered to it is considered that the development poses no additional COVID-19 risk.

4.5.2.3 Social Infrastructure

The Proposed Development will consist of a total of 383 no. residential units and result in an increase in the population of the surrounding area. A Social Infrastructure Audit and Retail Services Assessment was carried out by KPMG Future Analytics (June 2022). This report established the capacity of the existing social infrastructure within a 2km study area surrounding the Proposed Development to support the needs of the existing population and future residents. The Proposed Development includes a neighbourhood centre which will consist of a creche, office space, a medical centre and retail space which will positively contribute to the existing social infrastructure and amenities of the residents once completed. The Site is also located in close proximity to pipeline retail planning permissions in Carrickmines and the M50 motorway which according to the Social Infrastructure Audit and Retail Services Assessment is sufficient to cater for future residents.

A childcare capacity audit of the existing facilities was conducted by KPMG Future Analytics in May 2022 for the study area comprising an approximate 2km radius from the subject Site. Based on this survey and considering the Proposed Development includes a creche 439 sq m, with capacity for 100 children, the demand created by Proposed Development can be absorbed by the existing provision in conjunction with the proposed creche facility. Given that the Proposed Development is expected to generate between 24 to 37 children in the age group 0-6 years and the proposed creche would be a welcome provision for the development and within the area, to accommodate any future and excess demand within the development and broader study area.

4.5.2.4 Air Quality and Climate

The greatest potential effect on air quality during the Operational Phase of the Proposed Development is from traffic-related air emissions. The Air Quality and Climate Chapter notes that the impact of the Proposed Development is predicted to be imperceptible with respect to the Operational Phase in the long term. Therefore, no site-specific mitigation measures are required.

Sustainable modes of transport are encouraged through the pedestrian and cycle links to the surrounding area and the provision of bicycle parking. By sustainably densifying the Site through the provision of medium density housing and a Neighbourhood Centre on underutilised lands at the heart of Kilternan Village, the Proposed Development will contribute to improved air quality through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport.

An Energy Statement has been prepared by Waterman Moylan (June 2022) which identifies the energy standards with which the Proposed Development will have to comply and sets out the overall strategy that will be adopted to achieve these energy efficiency targets. The dwellings will be required to minimise overall energy use and to incorporate an adequate

proportion of renewable energy in accordance with Building Regulations Part L 2019, Conservation of Energy & Fuel.

4.5.2.5 Noise and Vibrations

Noise is fully assessed in Chapter 9 of this EIAR. It is not expected that there will be any significant sources of noise or vibration during the Operational Phase. The primary source of outward noise in the operational context relates to any changes in traffic flows along the local road network and any operational plant noise used to serve the ancillary elements within the house, duplex and apartment buildings and retail / commercial units. The residential aspect of the development is not expected to generate any significant noise sources over and above those which form part of the existing environment at neighbouring residential areas (estate vehicle movements, children playing etc.) and hence no significant impact are expected from this area of the development site.

A ProPG: Acoustic Design Statement has been prepared by RSK (June 2022) which considers the potential impact of the existing and future noise sources on future residents of the Proposed Development, along with an assessment of the potential operational phase noise impact of the Proposed Development to nearby existing receptors. The report considers the impact of the existing traffic and the future Glenamuck District Roads Scheme (GDRS) traffic noise on the Proposed Development. Measures to mitigate noise impacts have been specified within this report and can be summarised as;

- Provision of glazing with minimum sound insulation properties
- Provision of acoustically attenuated ventilation with minimum sound insulation properties

The ProPG Acoustic Design Statement concluded that the likely noise impact of the Proposed Development in its operational phase is not significant.

The impact assessment of noise and vibration has concluded that additional noise associated with the operation of the facility will not create any noise nuisance beyond the Site boundary. No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase. The impact of noise from operational traffic will be unnoticeable and will not have a negative impact. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development. No population and human health impacts are anticipated as a result of noise during the Operational Phase of the Proposed Development.

4.5.2.6 Landscape and Visual Impact

The potential landscape and visual effects of the Proposed Development are fully assessed in Chapter 10 of this EIAR. The Proposed Development has the potential to cause visual impact during the Operational Phase. The Site is currently predominately greenfield and includes a 0.35 Ha derelict farmyard area. The surrounding area is predominantly residential and agricultural.

Significant changes will occur on the landscape of the site, mainly with the removal of trees and hedgerows and general construction activity to the implementation of the proposed

buildings, but these changes will also be counterbalanced with the implementation of the new green structure and maintenance of some of the most important hedgerows.

A range of high-quality public and communal open spaces have been included in the Landscape Design for the recreational and amenity requirements of future residents and for the wider community. The Dun-Laoghaire Rathdown Development Plan requires a minimum of 15% of the site area to be provided as public open space resulting in a requirement for 16,144 sq m of public open space to be provided. The scheme provides significantly in excess to the minimum requirement and this by including 18,879 sq m of Public Open space and 2,934 sq m communal space. This, in conjunction the pedestrian / cycle links provided through the site, will enhance the amenity of Kilternan Village.

The Proposed Development will make a positive contribution to the surrounding area by developing a key underutilised site and providing a high-quality residential development and Neighbourhood Centre, which will provide linkages through the site to the neighbouring Rockville development and the future Glenamuck Link Distributor Road (GLDR). The design layout includes several open spaces available to the public such as the village green, a woodland walk, pocket park and the Dingle Way, which will provide amenity and biodiversity. The impact of the Proposed Development on landscape will be negligible to no impact, neutral and long term for the Operational Phase.

The Proposed Development will have strong connections to surrounding developments and the wider area through a range of high-quality public and communal open spaces and linkages through the site. The Proposed Development Site will be opened up onto the Enniskerry Road and the provision of a Neighbourhood Centre and Village Green will positively contribute for the recreational and amenity requirements of future residents and for the wider community of Kilternan Village. The Proposed Development will improve pedestrian facilities along Enniskerry Road by narrowing the carriageway and creating an additional 2 metre footpath/verge.

It is not expected that the Operational phase of the Proposed Development will cause any negative impact. The potential landscape impacts will be neutral and long-term as a result of the Proposed Development.

4.5.2.7 Traffic

A full assessment of traffic and transport impacts during the Operational Phase are presented in Chapter 12.1 of this EIAR. In the medium to longer term, the construction of the Glenamuck District Roads Scheme will reduce traffic volumes along both Glenamuck Road and Enniskerry Road. As such the medium to longer term impact of the Proposed Development on the local road network is already addressed by the distributor schemes and the accompanying Modelling Report (Review of Glenamuck Local Area Plan – Traffic Modelling Report; Dun Laoghaire Rathdown County Council May 2013). Therefore, the impact of the Proposed Development only needs to be addressed in the short to medium term context of its impact on both the Glenamuck Road and Enniskerry Road post construction of the Part 8 Scheme and prior to completion of the two distributor roads.

The Traffic and Transport Assessment concluded that the impact of development traffic on the surrounding road network is negligible in both the opening year scenario when the GDRS is

not available and in the +5 and +15 year scenarios when the GDRS is operational. In the future year scenarios, the operation of the GDRS will result in significant reduction in traffic travelling along Enniskerry Road and through the Enniskerry Road / Glenamuck Road Junction.

The Proposed Development Site is well located, served by public transport and is within a short distance of key employment locations such as Kilternan Village, Stepaside Village, Carrickmines, Enniskerry, Sandyford Business District, Dundrum and links to the M50. The Ballyogan Wood LUAS stop is located within 2.3 km – 2.7 km to the north-east (26-31 minutes walking distance Access to the M50 Carrickmines (Exit 15) is located 1.9 km from the Site, a 3 No. minute car journey away. Bus route Nos. 44, 63 and 118 serve the Kilternan and Glenamuck area with direct links to Dublin City Centre and institutions such as Dublin City University in Glasnevin. There are also several proposed new bus routes for Kilternan within the Bus Connects scheme which will serve Kilternan Village and offer transport links to Dublin City Centre and other suburbs and employment and education facilities in the greater Dublin area such as University College Dublin. A Mobility Management Plan prepared by Atkins (November 2021) provides further detail in relation to the existing and proposed public transport facilities serving the Proposed Development Site.

Access to public transport services such as the LUAS and Dublin Bus, easy access to the M50, the proposed GDRS scheme along with the new Bus Connects scheme will reduce traffic volume. Furthermore, the Proposed Development will promote and encourage sustainable modes of transport by providing permeable linkages through the site such as the Dingle Way and through various pedestrian and cycle links to the surrounding area and the provision of bicycle parking.

Therefore, the accessible urban location of the Proposed Development Site, provided with high quality walking and cycling facilities and is in proximity to a wide range of services and employment locations will ultimately promote sustainable modes of transport and result in negligible impact for the Operational Phase.

4.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the cumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

The cumulative effects of the Proposed Development on the Population and Human Health have been assessed taking other planned, existing, and permitted developments in the surrounding area into account. Table 4-16 details the Residential Planning Applications at Rockville located to the north-east of the subject Site. Table 4-17 details the existing, proposed and granted planning permissions on record in the area.

Table 4-16: Residential Planning Applications on lands at Rockville

Planning Reference No.	Location	Description of Development	Cumulative Impact Assessment
D20A/0015	Site located to the southeast of Glenamuck Road South, Kiltiernan, Dublin 18	ABP Decision: Grant Permission subject to 19 no. conditions Date: 06 Mar 2020 Permission for a Phase 2B residential development. The application site is located to the southeast of the Phase 1 residential development permitted under Reg. Ref.: D17A/0793 which is currently under construction. The Phase 2B proposal relates to the construction of a four-storey apartment block comprising of 56 no. residential units including 11 no. 1 beds, 39 no. 2 beds and 6 no. 3 beds. The apartment block includes a gym facility with GFA of 50.6 sqm a creche facility with GFA of 126 sqm, both at ground floor level, and private, communal and public open space. The proposed includes a homezone access and parking area containing 72 no. surface parking spaces, cycle parking spaces, including bike stores, and bin stores. The proposal includes all associated site works, including internal access roads, cycleways and footpaths, drainage, hard and soft landscaping and boundary treatment. The proposed development will connect to the infrastructure and services in the permitted Phase 1 residential development to the northwest and provide for future connections to other adjoining lands.	An Outline Construction Environmental Plan prepared by Atkins features a number of mitigation measures for the Construction Phase to ensure there will be no significant impacts on air quality, dust, hydrology or noise and vibration. A Mobility Management Plan has also been prepared which includes an Action Plan to promote sustainable transport modes such as public transport, walking and cycling which will reduce traffic volumes on the surrounding road network by reducing single car occupancy trips.
D18A/0566 (amended by D18A/1191)	Lands south of Rockville House, Glenamuck Road South, Kiltiernan, Dublin 18	DLRCC Decision: Grant Permission subject to 26 conditions Date: 02 October 2018 Phase 2A of Rockville: Construction of 6 no. four-bed houses on a site south of Rockville House, with building heights of 2.5 no. storeys. The development will be	Addition to the residential development permitted under Reg. Ref: D17A/0793 (see cumulative impacts below)

Planning Reference No.	Location	Description of Development	Cumulative Impact Assessment
		accessed from the permitted local road within the adjoining the residential development to the north. The proposal is a small addition to the residential development permitted under Reg. Ref.: D17A/0793 for 49 no. Units (37 no. dwellings and 12 no. apartments) and will be accessed from the permitted local road within the adjoining the residential development to the north. The proposed residential units are as follows: 3 no. House Type D1 - 2.5 storey 4 no. bed semi-detached dwelling (c.163. 5sq.m) House Type D2 - 2.5 storey 4 no. bed terraced dwelling (c.146.2 sq.m) House Type D3 - 2.5 storey 4 no. bed terraced dwelling (c.137.7 sq.m) House Type D4 - 2.5 storey 4 no. bed semi-detached dwelling (c.137.7 sq.m). Each residential unit is provided with 2 no. curtilage car parking spaces and private gardens which ranged from c.75-84 sqm. Under DLR Reg. Reg. D18A/1191, an amendment application was submitted, which sought a change of house types only. Permission was granted by the Planning Authority on 19th February 2019, which was subject to a Third-Party Appeal to An Bord Pleanála (ABP-303871-19). Permission was ultimately granted on 24th June 2019 subject to 11 No. conditions.	
D17A/0793	Lands south of Rockville House, Glenamuck Road South, Kiltiernan, Dublin 18	Grant Permission (subject to 38 no. conditions) Date: 25 January 2018 This development will be the first phase of development on the residential zoned lands at Rockville House. Demolition of existing agricultural outbuildings on site; Retention of Rockville House to provide for 2 No. separate residential dwellings. Construction of a total of 49 No. dwellings consisting of 37 No. detached, semi-detached and	Development works have been completed. Therefore, there are no potential cumulative impacts. This development has been considered within the baseline assessment for the Proposed Development.

Planning Reference No.	Location	Description of Development	Cumulative Impact Assessment
		terraced 2/3 storey houses and 12 No. apartments. The apartments will be provided within 1 no. four storey apartment block. Provision of 95 No. car parking spaces and a new vehicular access from Glenamuck Road South.	

Table 4-17: Recent Strategic Housing Development Applications

Planning Reference No.	Location	Description of Development	Cumulative Impact Assessment
ABP – 312214 – 22 Applicant: Heronvale Developments Ltd.	Lands at Shaldon Grange, located off Enniskerry Road (R117), Kilternan, Dublin 18	Grant Permission with conditions Date: 11th April 2022 130 no. residential units (55 no. houses, 75 no. apartments) and associated site works.	An EIA Screening Assessment and AA Screening Report were submitted with the application. The proposed development is not be likely to have significant effects on the environment. A Traffic and Transport Assessment was completed by DBFL. The impact of the proposed development on the surrounding road network will be negligible based on the anticipated levels of traffic and the level of mitigation achieved following the implementation of the GDDR / GLDR road infrastructure upgrades. Therefore, there are no potential cumulative impacts.
ABP-309846-21	Enniskerry Road SHD, Adjoining Bishop's Gate Housing Development	Grant Permission subject to 26 No. conditions Date: 15 July 2021	A Traffic and Transport Assessment completed by DBFL Consulting Engineers concluded that the impact of the Proposed Development on the surrounding road network will be negligible. The full occupation of the 203 residential units is likely to occur in parallel with the scheduled

Planning Reference No.	Location	Description of Development	Cumulative Impact Assessment
Applicant: Adroit Operations Limited		203 No. residential units (109 No. houses, 94 No. apartments) and a creche. The heights range from 2 to 3 No. storeys. Vehicular access serving the proposed development primarily via the existing junction off Enniskerry Road serving the Bishops Gate development.	completion of the emerging GDDR/GDLR road scheme. Therefore, there are no potential cumulative impacts.
ABP-307043-20	Suttons Fields, Ballybetagh Road, Kilternan Village, Dublin 18	Grant Permission subject to 28 No. conditions Date: 28 August 2020 Permission for a strategic housing development consisting of 116 dwellings and creche. The dwellings will comprise: 85 No. houses and 31 No. apartments. The buildings will range from 1-3 No. storeys in height. The development will include a Main Road on its west boundary, running from Ballybetagh Road to the north boundary, that will facilitate linkage to development lands to the north. Pedestrian and cycle access will be provided from Ballybetagh Road into the site, along the west boundary of Our Lady of the Wayside National School, connecting to the site circulation roadway in the vicinity of the childcare unit	A Construction and Waste Management Plan has been prepared by Donnelly Troy & Associates which details control and mitigation measures to ensure there is no significant impact on the local community and infrastructure during the Construction Phase. This includes measures relating to dust, noise, vibration and health and safety. A Transportation Assessment prepared by NRB Consulting Engineers also concluded that in the Operation Phase the Proposed Development will have a negligible impact on the local traffic conditions and can easily be accommodated without capacity concerns. A Mobility Management Plan has also been prepared to promote sustainable transport modes and reduce single-occupancy car commuting trips. Therefore, there are no potential cumulative impacts.
ABP-306160-19	Glenamuck Road, Enniskerry Road, Kiltiernan, Dublin 18	Grant Permission subject to 31 No. conditions Date: 06 April 2020 1) the demolition of 2 No. habitable dwellings on the site - 'Greenmount' (195 sq m) and 'Dun Óir' (345 sq m inclusive of ancillary buildings); 2) i) the construction of a 197 No. unit residential development comprising: 62 No. houses and 115 No. apartments in 7 No. blocks ranging in height from 3 to 4	An Outline Construction Environmental Plan prepared by Atkins features a number of mitigation measures for the Construction Phase to ensure there will be no significant impacts on air quality, dust, hydrology or noise and vibration.

Planning Reference No.	Location	Description of Development	Cumulative Impact Assessment
		No. storeys, and 20 No. duplex apartments in 4 No. three storey blocks; (ii) a 275 sq m crèche; (iii) the construction of the link access road between Enniskerry Road and Glenamuck Road required under the Kilternan/Glenamuck Local Area Plan 2013 including vehicular access points onto Enniskerry Road and Glenamuck Road.	A Traffic and Transport Assessment prepared by Atkins also concluded that during the Operational Phase there will be no traffic increase greater than 5% on the surrounding junctions or M50 pipeline. Both development access points operate well within capacity. Therefore, there are no potential cumulative impacts.
ABP-303978-19	Glenamuck Road, Enniskerry Road, Kiltiernan, Dublin 18	Grant Permission subject to 31 No. conditions Date: 26 June 2019 203 residential units within 12 No. blocks ranging in height from 3-6 No. storeys). The provision of a creche, a retail unit and a social/amenity facility. The development will include a new access from Glenamuck Road and the provision of access connection points, vehicular, cycle and pedestrian) to future adjacent development lands.	An Environmental Impact Assessment Screening Report prepared by MacCabe Durney Barnes concluded that possible effects on the environment are not considered significant. The Construction Management Plan prepared by Corrigan Hodnett Consulting also details environmental management measures to prevent significant impacts as a result dust, dirt, noise and vibration. A Transportation Assessment prepared by NRB Consulting Engineers also concluded that during the Operation Phase the Proposed Development will have an unnoticeable impact on future local traffic conditions and can easily be accommodated on the road network. A Travel Plan has also been prepared which details the public transport options and aims to promote sustainable transport modes and reduce single-occupancy car commuting trips. Therefore, there are no potential cumulative impacts.

The main sources of potential cumulative impacts during the Construction Phase relating to population and human health are air quality, dust, noise, and vibration as a result of construction activities. The main sources of potential cumulative impacts during the Operational Phase relating to population and human health are increased traffic due to an increase in the population of the surrounding area.

There is a potential cumulative impact on road users and safety from the permitted planning applications listed in Table 4-16 and Table 4-17, which are located in close proximity to the Proposed Development. During the Construction Phase, there will be some traffic impacts on the receiving environment because of Construction Phase related traffic. Measures to address these impacts are detailed in the Outline Construction Traffic Management (within the Outline Construction Management Plan) for the Proposed Development and they will be slight and short-term. Operational Phase traffic has also been assessed in the Traffic and Transport Assessment prepared for the Proposed Development which concluded that the surrounding road network will have sufficient capacity to receive both the existing residents of the surrounding area and the future residents of the Proposed Development. Based on the implementation of the control and mitigation measures for the off-site developments and the Proposed Development there will be no cumulative impacts relating to population and human health.

4.5.4 "Do Nothing" Impact

A 'Do Nothing' scenario would result in the Site continuing to be predominately greenfield and with derelict farmyard area. If the lands were to remain undeveloped, this would be an under-utilisation of lands zoned for residential development and mixed-use neighbourhood centre facilities. A failure to deliver the Proposed Development would result in a growing need for additional residential units within the Greater Dublin Area not being met, with implications for use of greenfield lands more remote from the city centre and from established services in the transport, education, social and commercial sectors.

4.6 Avoidance, Remedial & Mitigation Measures

4.6.1 Construction Phase

During the Construction Phase of this Proposed Development HSE guidelines will be adhered to in relation to social distancing, cough and sneeze etiquette, face masks and hand washing. Appropriate welfare facilities will be provided at the facility. No specific mitigation measures are required during the Construction Phase of the Proposed Development in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air emissions (dust), noise, traffic, waste etc. are identified in their respective Chapters in this EIA Report.

4.6.2 Operational Phase

All workers employed during the Operational Phase of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that will be in place at that point in time in relation to Covid-19.

No other specific mitigation measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air emissions, noise, traffic etc. are identified in their respective Chapters in this EIAR.

4.6.3 "Worst Case" Scenario

If mitigations measures relating to COVID-19 fail, there is a risk that there may be an outbreak of COVID-19 at the facility. An outbreak of COVID-19 is when two or more cases of the disease are linked by time, place or person. The '*General Guide on Management of COVID-19 Outbreaks in the Workplace'*, published in June 2021 by the HSE (or other updated HSE and Government protocols that are in place at that point in time) will be adhered to if any employees test positive for COVID-19. In some instances, it may be necessary to close the workplace in order to control the spread of COVID-19.

4.7 Residual Impacts

Residual Impacts are defined *as 'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

No negative residual impacts in the context of population and human health are anticipated regarding this Proposed Development.

Construction and Operational phase of the Proposed Development will create employment which will have a *positive* impact on the local socio-economic environment.

The development will also provide additional housing options for those already employed in the area, which will reduce commute times. There will be a *'permanent major positive'* impact on local settlement as a result of the Proposed Development.

4.8 Monitoring

4.8.1 Construction Phase

No specific monitoring measures are proposed or required in relation to Population and Human Health for the Construction Phase of the Proposed Development.

Monitoring activities will be implemented for the Construction Phase in accordance with the CEMP submitted as part of this planning application. The monitoring of construction dust during the Construction Phase of the Proposed Development is recommended to ensure that impacts on air quality are not experienced beyond the Site boundary and human health is not affected.

4.8.2 Operational Phase

No specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required,

monitoring in relation to air emissions, water, noise and traffic are identified in their respective Chapters in this EIAR.

4.9 Interactions

4.9.1 Land and Soil

The Construction Phase of the Proposed Development could give rise to short-lived dust from the site and from soil spillages on the existing road network around the site which may impact population and human health, especially during dry conditions. Dust control measures will be carried out to ensure that dust nuisance affecting population and human health and neighbouring properties is minimised. Good construction management practices, as detailed in the CEMP, will minimise the risk of pollution from construction activities at the Site.

During the Operational Phase, due to best management practices, good housekeeping, and adherence to all health and safety procedures, it is not foreseen that there will be any negative impacts to population and human health.

4.9.2 Hydrology

There is potential for significant impacts between Population and Human Health with Hydrology and the water quality of the surrounding area. Pollution events can impact the water quality. Appropriate surface water and foul water control measures will be implemented as part of the Proposed Development. No public health issues associated with the water conditions at the Site have been identified for the Construction Phase or Operational Phase of the Proposed Development. Appropriate industry standards and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers. Hydrology has been fully assessed in Chapter 7 of this EIAR.

4.9.3 Air Quality

Interactions between Air Quality and Population and Human Health have been considered as the Construction and Operational Phase has the potential to cause health issues as a result of impacts on air quality, particularly dust emissions. The Air Dispersion Model carried out as part of this EIAR has determined that all emissions from the facility will not exceed their recommended emission limit values; therefore, human health will not be adversely affected in this regard. Appropriate control and mitigation measures employed at the Proposed Development will ensure there will be no significant impacts in relation to air quality standards and human health.

Furthermore, traffic-related pollutants have been determined as negligible, therefore air quality impacts from the Proposed Development are not expected to have a significant impact on population and human health.

4.9.4 Noise

Construction activities such as site clearance, building construction works, and trucks and vehicles entering and exiting the Site have the potential to interact with the surrounding population and human health. The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and last only for the duration of the Construction Phase. There will be no adverse impact on

population and human health. The operational noise and vibration impact is not significant with a neutral effect. Noise is fully assessed in Chapter 9 of this EIAR.

4.9.5 Landscape and Visual

The Proposed Development will alter the visual appearance of the Site which currently contain disused farm buildings. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the rural and residential nature of the surrounding landscape, will cause any issues for the residential local population.

4.9.6 Material Assets – Waste and Utilities

The improper removal, handling and storage of hazardous waste has the potential to negatively impact on the health of construction workers. The Construction and Demolition Waste Management Plan (CDWMP) and CEMP (Enviroguide, 2022) details mitigation measures to ensure the safety of the workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health.

4.9.7 Material Assets – Traffic

Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of vehicles. There is potential for impacts on population and human health in relation to the capacity and operation of the surrounding road network. However according to Chapter 12.1 Traffic, the impact of development traffic is of the order of low in the case of the without GDRS to negligible when the GDRS is available.

4.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter of the EIAR.

4.11 References

The Central Statistics Office (CSO)

Dun Laoghaire-Rathdown County Development Plan 2022-2028

The Regional Planning Guidelines of the Greater Dublin Area 2010-2022

Ordinance Survey Ireland (OSI)

WHO Ottawa Charter for Health Promotion First International Conference on Health Promotion Ottawa, 21 November 1986 - WHO/HPR/HEP/95.1. 1986.

WHO Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. 1946.

Healthy Ireland Framework 2013-2025

Farrell, C., McAvoy, H., Wilde, J. and Combat Poverty Agency (2008), Tackling Health Inequalities – An All-Ireland Approach to Social Determinants. Dublin: Combat Poverty Agency/Institute of Public Health in Ireland.

Wilkinson, Richard; Marmot, Michael, eds. (2003). The Social Determinants of Health: The Solid Facts (PDF) (2nd ed.). World Health Organization Europe.

Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999)

Work Safely Protocol COVID-19 National Protocol for Employers and Workers (Government of Ireland, V14, May 2021)

General Guide on Management of COVID-19 Outbreaks in the Workplace' (HSE, June 2021)

Standards for Cycle Parking and associated Cycling Facilities for New Developments (Dún Laoghaire-Rathdown County Council Municipal Services Department, January 2018)

5 BIODIVERSITY

5.1 Introduction

Scott Cawley Ltd. were commissioned to undertake an Ecological Impact Assessment of the proposed strategic housing development on 11.2 Ha of lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18 (as per Figure 5-1) to inform the Environmental Impact Assessment Report (EIAR) which forms part of the planning application. Further details regarding the Proposed Development can be seen in Chapter 2.

This biodiversity Chapter for the EIAR has been prepared by Shea O'Driscoll and Wayne Daly and reviewed by Tim Ryle, all of Scott Cawley Ltd.

Shea O'Driscoll, Senior Ecologist with Scott Cawley Ltd, holds an honours degree in Zoology from University College Dublin and a Masters in Advanced Wildlife Conservation in Practice from the University of the West of England, Bristol. Shea has professional experience working in South Africa and the United States, as well as more recent experience within Ireland and the UK. He has experience in habitat survey and assessment in a range of terrestrial and aquatic environments, surveys for protected species including otter, bats and badger, he has undertaken a number of ecological clerks of works roles as well as invasive species surveys for public infrastructure works across Ireland. Since joining Scott Cawley Ltd., Shea has been project manager on ecological assessments that include PEA, EcIA and AA Screening for a range of projects including tourism, industrial, residential and renewable energy developments.

Wayne Daly is a Consultant Ecologist with Scott Cawley Ltd. He holds an honours degree in zoology from UCD and completed his Masters in Biodiversity and conservation at Trinity College Dublin. Wayne has professional experience working in the United States and various parts of Ireland for the last six years. His work has included conducting habitat surveys, teaching Ecology through public lectures, and leading citizen science programs involving phenology in trees. He has a great interest and enthusiasm in ecology, with a special interest in mammals, and continues to further his skills with online courses. Since joining Scott Cawley his work has been assisting with senior ecologists on the collection of ecological data, data analysis, desktop work and preparation of Appropriate Assessment reports.

Tim Ryle is a Principal Ecologist with Scott Cawley Ltd. He holds an honours degree in Botany from University College Dublin and was later awarded a Ph.D. from the same institution. He is a full Member of the Institute of Environmental Scientists. Tim is an experienced ecological consultant with twenty years' experience in in private consultancy in designing, undertaking and managing a wide range of ecological surveys and in assessing impacts and designing mitigation measures and biodiversity enhancements, in particular for protected species including badgers, otters, bats, birds, amphibians as well as habitats of conservation importance. He is also experienced in undertaking appropriate Assessment for small-scale development projects and larger infrastructural projects, land plans as well as national/government plans.

Figure 5-1: Location of the Proposed Development site within the surrounding environment

The aims of this assessment were to:

- Establish baseline ecological data for the Proposed Development site and other relevant areas;
- Determine the ecological value of the identified ecological features;
- Assess the impact of the Proposed Development on ecological features of value;
- Recommend mitigation measures to avoid, reduce and remedy the identified impacts; and,
- Identify any residual impacts after mitigation.

5.1.1 Consultation

A consultation request was submitted to the Development Application Unit (DAU), Department of Housing, Local Government and Heritage, by email in May 2022 regarding any information or ecological requirements in relation to the Proposed Development area or the immediate surrounding environment. No response has been received at the time of writing.

5.2 Study Methodology

5.2.1 Planning, Policy and Legislation

The assessment of the likely impacts of the Proposed Development on ecological resources has considered legislation, policy documents, and guidelines outlined in the following section.

5.2.1.1 International and National Legislation

The following international legislation has been considered in respect of the Proposed Development:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter, referred to as the 'Habitats Directive'. The Habitats Directive is the legislation under which the Natura 2000 network[2] was established and Special Areas of Conservation (SACs) are designated for the protection of natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of that directive.
- Directive 2009/147/EEC; hereafter, referred to as the 'Birds Directive'. The Birds Directive is the legislation under which Special Protection Areas (SPA's) are designated for the protection of endangered species of wild birds listed in Annex I of that directive.

- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (hereafter referred to as the Water Framework Directive (WFD));

The following national legislation has been considered in respect of the Proposed Development:

- *Wildlife Acts 1976 to 2021*; hereafter collectively referred to as the 'Wildlife Acts'. The Wildlife Act and subsequent amendments is the principal piece of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife. All bird species, 22 other animal species or groups of species, and 86 species of flora are protected under this legislation.
- *Planning and Development Act 2000 (as amended)*; hereafter collectively referred to as the 'Planning and Development Acts'. This piece of legislation is the basis for Irish planning. Under the legislation, development plans (usually implemented at local

[2] The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats.

In Ireland these sites are designed as *European sites* - defined under the Planning Acts and/or the Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

authority level) must include mandatory objectives for the conservation of natural heritage and for the conservation of European Sites. It also sets out the requirements in relation to environmental assessment with respect to planning matters, including transposition of the Habitats and Birds Directive into Irish law.

- *European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015*; hereafter the 'Birds and Habitats Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).
- *Flora (Protection) Order, 2015*. This lists species of plant protected under Section 21 of the Wildlife Acts.
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EIAR). (EPA, 2022).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. August 2018. (Department of Housing, Planning and Local Government, 2018).

The following national biodiversity policies are relevant to the Proposed Development:

- National Biodiversity Action Plan 2017-2021 (Department of Culture Heritage and the Gaeltacht, 2017)

5.2.1.2 Local Authority Plans

A number of policies and objectives within the following plans are relevant to this Proposed Development:

- Dún Laoghaire-Rathdown County Development Plan 2022-2028 (Dún Laoghaire-Rathdown County Council, 2022)
- Dún Laoghaire-Rathdown Biodiversity Plan 2009-2013 (Dún Laoghaire-Rathdown County Council, 2013)
- Wicklow County Development Plan 2016-2022 (Wicklow County Council, 2016)

5.2.2 Scope of Assessment

The study area is defined by the zone of influence of the Proposed Development with respect to the ecological receptors that could potentially be affected.

The Zone of Influence (ZoI), or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present within, and in the vicinity of, the Proposed Development site. The ZoI and study area was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the Proposed Development.

The ZoI of habitat loss impacts will be confined to the area within the Proposed Development boundary.

The ZoI of potential impacts on surface water quality in the receiving environment could potentailly extend downstream as far as Killiney Bay.

The ZoI of general construction and operational activities (i.e. risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is considered unlikley to extend more than several hundred metres from the site of the Proposed Development.

5.2.3 Desk Study

A desk study was undertaken on the 17th May 2022, to collate available information on the local ecological environment. The following resources were used to inform the assessment presented in this report:

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from https://www.npws.ie/protected-sites and https://www.npws.ie/maps-and-data – refer to Figure 5-3 and Figure 5-4 for locations of protected sites in the vicinity of the Proposed Development[3] ;
- Records of rare and protected species for the 2km grid square(s), as held by the National Biodiversity Data Centre www.biodiversityireland.ie;
- Ordnance Survey Ireland mapping and aerial photography from http://map.geohive.ie/;
- Data on waterbodies, available for download from the Environmental Protection Agency (EPA) web map service. Available from https://gis.epa.ie/EPAMaps/;
- Information on soils, geology, and hydrogeology in the area available from the Geological Survey Ireland (GSI) online Spatial Resources service. Available from https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx;
- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland (Gilbert *et al*., 2021);
- Information on the location, nature and design of the Proposed Development supplied by the applicant's design team; and
- Information contained within an Appropriate Assessment (AA) for this proposed strategic housingdevelopment (Scott Cawley Ltd, 2022).

5.2.4 Field Surveys

This section details the methodologies of all ecological surveys undertaken at the Proposed Development site.

[3] The following SAC and SPA GIS boundary datasets are the most recently available at the time of writing: SAC_ITM_2022_02 and SPA_ITM_2021_10. Dates for PNHA and NHA datasets should be included also NHA_ITM-2019_06 and pNHA_ITM_2015_11

Table 5-1: Ecological surveys and survey dates

Survey	Survey Date(s)
Habitat surveys	1st July 2021
Terrestrial mammal (excl. bats) surveys	1st July 2021
Bat activity surveys	6th July 2021 (Dusk) 27th July 2021 (Dawn) 24th August 2021 (Dawn)
Bat static detector deployment/collection	Deployment 1st July 2020 24th August 2021
Breeding bird survey	1st July 2021 27th July 2021 24th August 2021 13th June 2022
Wintering bird survey	19th February 2021 2nd March 2021 19th March 2021 23rd November 2021 20th December 2021 19th January 2022 22nd February 2022 22nd March 2022
Updated site walkover survey (including updated survey for invasive species, signs of terrestrial mammals, PRFs)	17th May 2022

5.2.4.1 Habitat and Flora Surveys

Habitat surveys were undertaken at the Proposed Development site on the 1st July 2021 by Shea O'Driscoll of Scott Cawley Ltd. Cathal O'Brien of Scott Cawley performed a further site walkover survey on 17th May 2022, to verify habitat types had not changed from the survey undertaken on 1st July 2021. This survey encompassed all lands within the Proposed Development site.

Habitat surveys followed the methodology described in *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.,* 2011). All habitat types were classified using the *Guide to Habitats in Ireland* (Fossitt, 2000), recording the indicator species and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database* (Weekes & FitzPatrick, 2010), having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles* (Stace, 2019) and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide* (Atherton *et al.,* 2010). Annex I habitat types were classified after the Interpretation manual of *European Union Habitats EUR28* (European Commission, 2013) with reference to the corresponding national habitat survey reports and NPWS wildlife manuals, as applicable.

The nomenclature for Annex I habitats follows that of the Interpretation manual of *European Union Habitats EUR28* with abbreviated names after those used in *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview* (NPWS, 2019a and 2019b).

5.2.4.2 Fauna Surveys

5.2.4.2.1 Terrestrial Mammals (excluding Bats)

A terrestrial fauna survey (excluding bats) was undertaken on the 1st July 2021 by Shea O'Driscoll, of Scott Cawley Ltd. The presence/absence of terrestrial fauna species was determined through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species. An updated survey to check for the presence of terrestrial fauna setts within the study area, and to record any evidence of use (corresponding to earlier survey data and new results), was undertaken on the 17th May 2022.

5.2.4.2.2 Foraging, Commuting and Roosting Bats

Habitat suitability for foraging/commuting/roosting bats was assessed during the multidisciplinary site walkover survey of the Proposed Development site on 1st July 2021.

Bat Tree Inspections

During this site walkover survey on 1st July 2021 and during the updated site walkover in May 2022, the trees within the Proposed Development site were assessed for their potential to support roosting bats, having regard to the following guidelines:

- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016);
- Bat Mitigation Guidelines for Ireland (Kelleher & Marnell, 2006); and,
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2006a).

Several trees located across the Proposed Development boundary were examined from ground level for potential to support roosting bats. They were assessed based on the presence of features commonly used by bats. Examples of such features include:

- Natural holes;
- Cracks/splits in major limbs;
- Loose bark; and,
- Hollows/cavities.

Trees were assessed against suitability categories listed in Table 5-2.

Table 5-2: Assessment criteria for potential suitability of Proposed Development sites for bats, derived from similar criteria in Bat Surveys for Professional Ecologists: Good Practice Guidelines

Suitability	Description of Roosting Habitat	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions [4] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions2 and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to wider landscape that could be used by bats for foraging such as trees, scrub, grassland, or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats in a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to a known roost.

Bat Building Inspections

[4] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

Internal and external inspections of the buildings within the Proposed Development site were carried out during daylight hours on 1st July 2021 by Shea O'Driscoll and Wayne Daly of Scott Cawley Ltd. These buildings included a disused building on the site 'Rockville' and associated outbuildings within the southern corner of the site, metal storage sheds and shipping containers. A systematic inspection of the external and all accessible internal areas and roof spaces of the building involved a search for evidence of bats such as:

- Bat droppings (these will accumulate under an established roost or under access points);
- Insect remains (under feeding perches);
- Oil (from fur) and urine stains;
- Scratch marks;
- Pupae of bat parasites such as *Nycteribia kolenatii*; and,
- Bat corpses.

Any crevices, in so far as they could be safely accessed, were examined using a strong narrow-beamed torch and where necessary, an endoscope. Binoculars were used to examine potential bat roost features that could not be reached from the ground.

Bat Activity Surveys

Three separate bat activity surveys (including one post dusk and two pre-dawn) were undertaken by Scott Cawley Ltd between the 6th July 2021 and 24th August 2021. All surveys were carried out using direct observation and handheld ultrasound detectors (Elekon BatLogger M). These surveys involved emergence/ re-entry surveys at the buildings prior to walking transects which covered the site (as shown in Figure 5-2) and a representation of each habitat type within the lands to record bat activity across the site. The post dusk emergence survey and transect commenced 15 minutes prior to sunset and lasted for 1.5 – 2 hours, while the pre-dawn re-entry surveys and transects commence 1.5 hours prior to sunrise and commenced for 30 minutes afterwards. Surveys were undertaken within the main season of bat activity during calm dry weather conditions and the temperature on all nights was within the range suitable for bat activity (i.e. above 8°C). The data generated from the surveys was analysed using Elekon BatExplorer software to differentiate species by their sonograms. Calls were identified against species descriptions within *British Bat Calls: A Guide to Species Identification* (Russ, 2012).

Figure 5-2: Bat activity transect routes across the Proposed Development site and automated detector locations

Static detector deployment

The walked transects described above were supplemented by Songmeter 2 (SM2) BAT + (static bat detectors), which were deployed from the 1st July 2021 at three different locations within the Proposed Development site (as shown in Figure 5-2). These static detectors were collected on 24th August 2021. These locations were chosen with an emphasis on areas identified as being potentially suitable for roosting, commuting and/or foraging bats.

5.2.4.2.3 Breeding Birds

Habitat suitability for breeding birds was assessed during a site walkover survey of the Proposed Development site on 1st July 2021. Following this, three dedicated breeding bird surveys were undertaken within the Proposed Development site on 1st July 2021, 27th July 2021 and 24th August 2021 by Scott Cawley Ltd. An additional breeding bird survey was undertaken by Scott Cawley Ltd. on 13th June 2022. Methodology followed an adapted version from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species* (Gilbert *et al*., 1998). A walkover route was undertaken which covered the site and a representation of each habitat type within the Proposed Development site. . 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. Breeding bird territory analysis was undertaken, and territories

mapped as possible breeders, probable breeders, or confirmed breeders as per British Trust for Ornithology (BTO) recognised breeding bird behaviour classifications[5].

5.2.4.2.4 Wintering birds

Wintering bird surveys were initially undertaken on the 19th February 2021, 2nd March 2021 and 19th March 2021, with updated surveys undertaken on 23rd November 2021, 20th December 2021, 19th January 2022, 22nd February 2022 and 22nd March 2022 using a methodology based on the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species* (Gilbert *et al*., 1998). The study area covered all the lands within the Proposed Development site as shown on Figure 5-1. Lands were initially surveyed visually using binoculars/scope from a vantage point(s) at the edge of the study area followed by a walkover of the area to identify birds which may not be visible from a distance (e.g. waders) and evidence of usage by wildfowl such as swans or geese (e.g. droppings). Birds were identified by sight and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

5.2.5 Ecological Evaluation and Impact Assessment

5.2.5.1 Ecological Evaluation

Ecological receptors (including identified sites of ecological importance) are valued with regard to the ecological valuation examples set out in *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2 (NRA, 2009)* and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018)* – refer to Appendix B of this EIAR for examples of how ecological importance is assigned. In accordance with these guidelines, important ecological features within what is referred to as the Zone of Influence (ZoI) of the Proposed Development which are "both of sufficient value to be material in decision making and likely to be affected significantly" are deemed to be 'Key Ecological Receptors' (KERs). These are the ecological receptors which may be subject to significant effects from the Proposed Development, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importance (higher value) or greater.

5.2.5.2 Impact Assessment

Ecological impact assessment is conducted following a standard source-pathway-receptor model, where, in order for an impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potentially significant effect would not occur.

- Source(s) – e.g. pollutant run-off from proposed works
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats
- Receptor(s) – e.g. wetland habitats and the fauna and flora species they support

[5] https://www.bto.org/sites/default/files/u36/downloads/breedingcodes.pdf

5.2.5.3 Characterising and Describing the Impacts

The parameters considered in characterising and describing the potential impacts of the Proposed Development are per the EPA's *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*[6] and CIEEM's (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland*: whether the effect is positive, neutral or negative; the significance of the effects; the extent and context of the effect; the probability, duration and frequency of effects; and, cumulative effects.

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects:

- Existing projects (under construction or operational)
- Projects which have been granted consent but not yet started
- Projects for which consent has been applied for which are awaiting a decision, including those under appeal
- Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways)

The likelihood of an impact occurring, and the predicted effects, can also be an important consideration in characterising impacts. In some cases it may not be possible to definitively conclude that an impact will not occur. In these cases the evaluation of significant effects is based on the best available scientific evidence but where reasonable doubt still remains then the precautionary principle is applied and it may need to be assumed that significant effects may occur. Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

5.2.5.4 Significant Effects

In determining whether potential impacts will result in significant effects, the CIEEM guidelines (2018) were followed. The approach considers that significant effects will occur when there are impacts on either:

- the structure and function (or integrity) of defined sites, habitats or ecosystems; or
- the conservation status of habitats and species (including extent, abundance and distribution).

Integrity

The term "integrity" may be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (NRA, 2009).

The term 'integrity' is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, SPAs or pNHA/NHAs) but can also be

[6] Environmental Protection Agency. (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports. May 2022. (refer to Table 3.3)

the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites' habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

Conservation Status

Similar definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2018) and NRA (2009) guidance which are summarised as follows:

For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its extent, structure and functions as well as its distribution, or the long-term survival of its typical species, at the appropriate geographical scale

For species, conservation status means the sum of influences acting on the species concerned that may affect the abundance of its populations, as well as its distribution, at the appropriate geographical scale

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status, having regard to the definitions of favourable conservation status provided in the EU Habitats Directive 92/43/EEC – i.e. into the future, the range, area and quality of habitats are likely to be maintained/increased and species populations are likely to be maintained/increased.

According to the CIEEM (2018) methodology, if it is determined that the integrity and/or conservation status of an ecological receptor will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international). In some cases an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than an international level.

5.3 The Existing and Receiving Environment (Baseline Situation)

5.3.1 Designated Sites

5.3.1.1 European Sites

Special Areas of Conservation (SAC) are designated under the EC Habitats Directive (92/43/EEC) for the protection of habitats listed on Annex I and/or species listed on Annex II of the Directive. Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC) for the protection of bird species listed on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and areas of international importance for migratory birds.

There are no European sites within or directly adjacent to the boundaries of the Proposed Development site. The closest European sites to the Proposed Development are Knocksink Wood SAC (000725), located *c.* 2.7km to the south followed by Ballyman Glen SAC (000713), located 3.5km south.

The Proposed Development site is within the Ovoca-Vartry catchment. The closest watercourse to the Proposed Development site is the Shanganagh River, located 306m to the southeast. The Shanganagh River flows east for *c*. 6.5km until it discharges directly into Killiney Bay. The closest European sites to the outfall of the Shanganagh River at Killiney Bay include Rockabill to Dalkey Island SAC (003000) and Dalkey Island SPA (004172), located 1.5km and 3.2km respectively

The SAC and SPA sites in the vicinity of the Proposed Development, their distance from the Proposed Development and their Qualifying Interests/Special Conservation Interests are presented in Appendix B of this EIAR.

The locations of those SAC and SPA sites relative to the Proposed Development are illustrated in Figure 5-3.

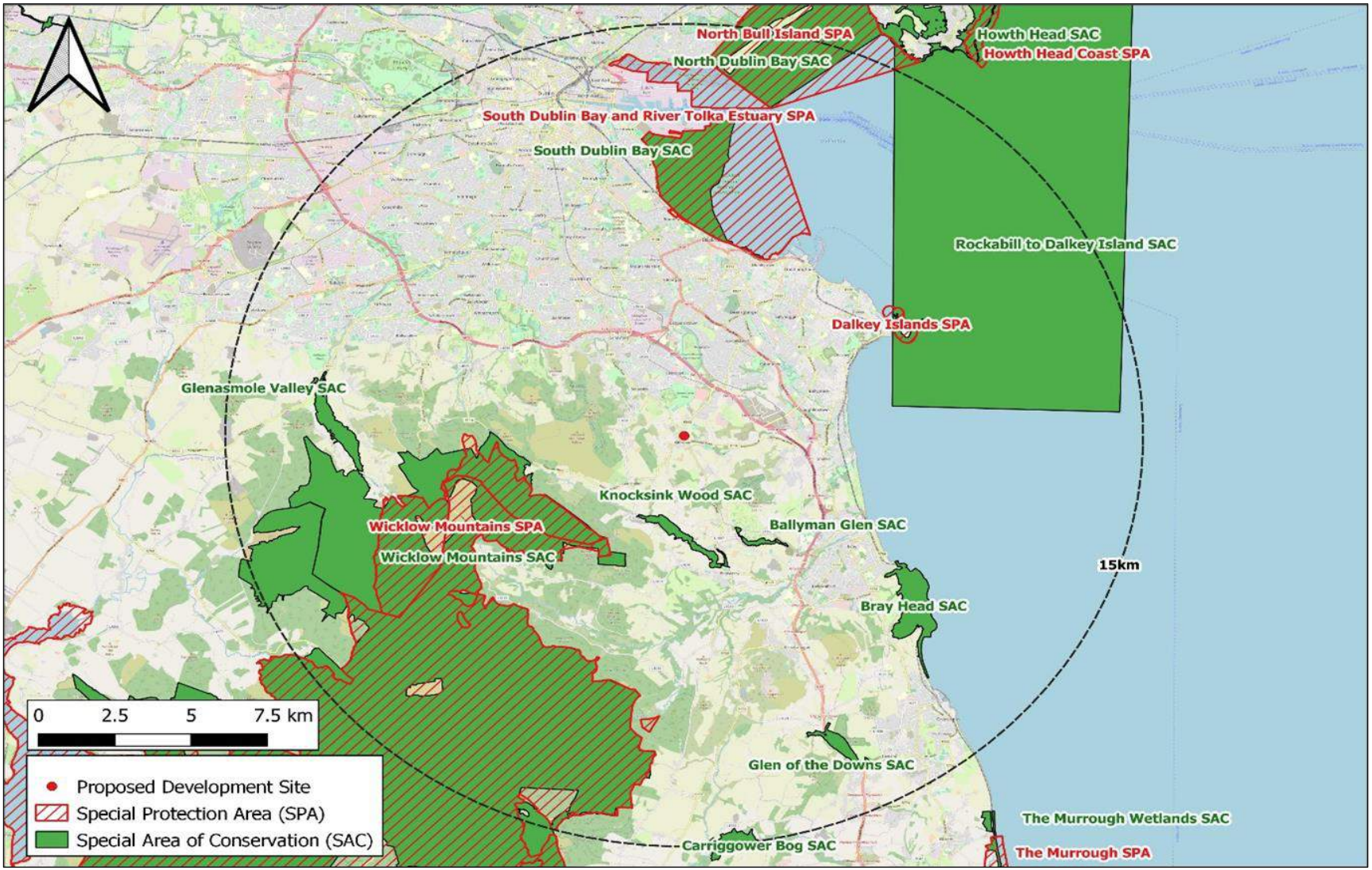

Figure 5-3: European sites in the vicinity of the Proposed Development site

5.3.1.2 Nationally Designated Sites

Natural Heritage Areas (NHAs) are designated under the Wildlife Acts to protect habitats, species or geology of national importance. In addition to NHAs there are proposed NHAs (referred to as pNHAs), which are also sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. Proposed NHAs are offered protection in the interim period under county or city development plans which requires that planning authorities give due regard to their protection in planning policies and decisions.

There are no nationally designated sites within or directly adjacent to the boundaries of the Proposed Development site. Several pNHA sites are located within the vicinity of the Proposed Development site. The nearest pNHA is Dingle Glen pNHA (001207) which is located approximately 642m east of the Proposed Development site. Other pNHAs in the vicinity of the Proposed Development site include Fitzsimon's Wood pNHA (001753), Loughlinstown Woods pNHA (001211), Ballybetagh Bog pNHA (001202), Ballyman Glen pNHA (000713), and Knocksink Wood pNHA (000725).

Surface waters within the Proposed Development site ultimately discharge into the Southwestern Irish Sea-Killiney Bay coastal waterbody via the Shanganagh River. Therefore the Proposed Development is hydrologically connected to the following nationally designated sites in the downstream receiving environment: Loughlinstown Wood pNHA (001211) and Dalkey Coastal Zone and Killiney Hill pNHA (001206). The latter site located *c*. 3.2km east at the closest point, has been designated for a range of features, including its coastal habitats.

The NHA and pNHA sites in the vicinity of the Proposed Development, their distance from the Proposed Development and their biodiversity features of note are presented in Appendix B of this EIAR.

The locations of those NHA and pNHA sites relative to the Proposed Development are illustrated in Figure 5-4.

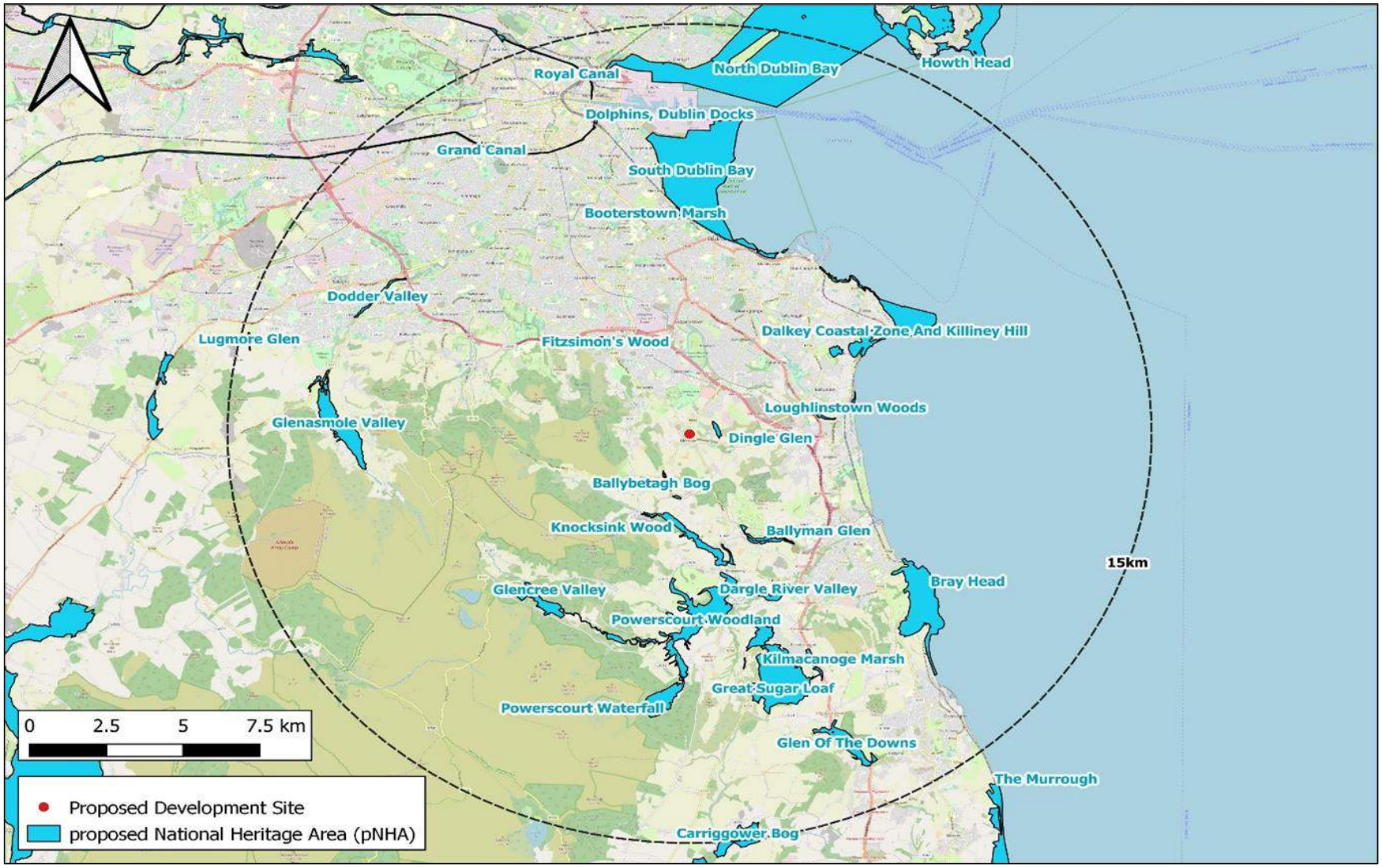

Figure 5-4: Nationally designated sites in the vicinity of the Proposed Development site

5.3.2 Habitats and flora

The National Biodiversity Data Centre (NBDC) database search returned no records of any plant species listed on Annex II of the EU Habitats Directive within 2km of the Proposed Development site. No Annex II plant species and no records of plant species protected through their inclusion within the Flora (Protection) Order, 2015 were recorded during the field surveys in 2021 or 2022.

With regards to records for non-native invasive species within *c.* 2km of the Proposed Development, the NBDC database search returned records for the following non-native invasive species which are listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended):

- Himalayan Knotweed *Persicaria wallichii*
- Giant hogweed *Heracleum mantegazzianum*
- Giant-rhubarb *Gunnera tinctoria*
- Japanese Knotweed *Reynoutria japonica*
- Spanish Bluebell *Hyacinthoides hispanica*
- Three-cornered garlic *Allium triquetrum*

No non-native invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) were recorded within the Proposed Development site during surveys in 2021 or 2022.

The following habitat types of the Heritage Council classification system (Fossitt, 2000) were identified within the Proposed Development site and are mapped in Figure 5-5.

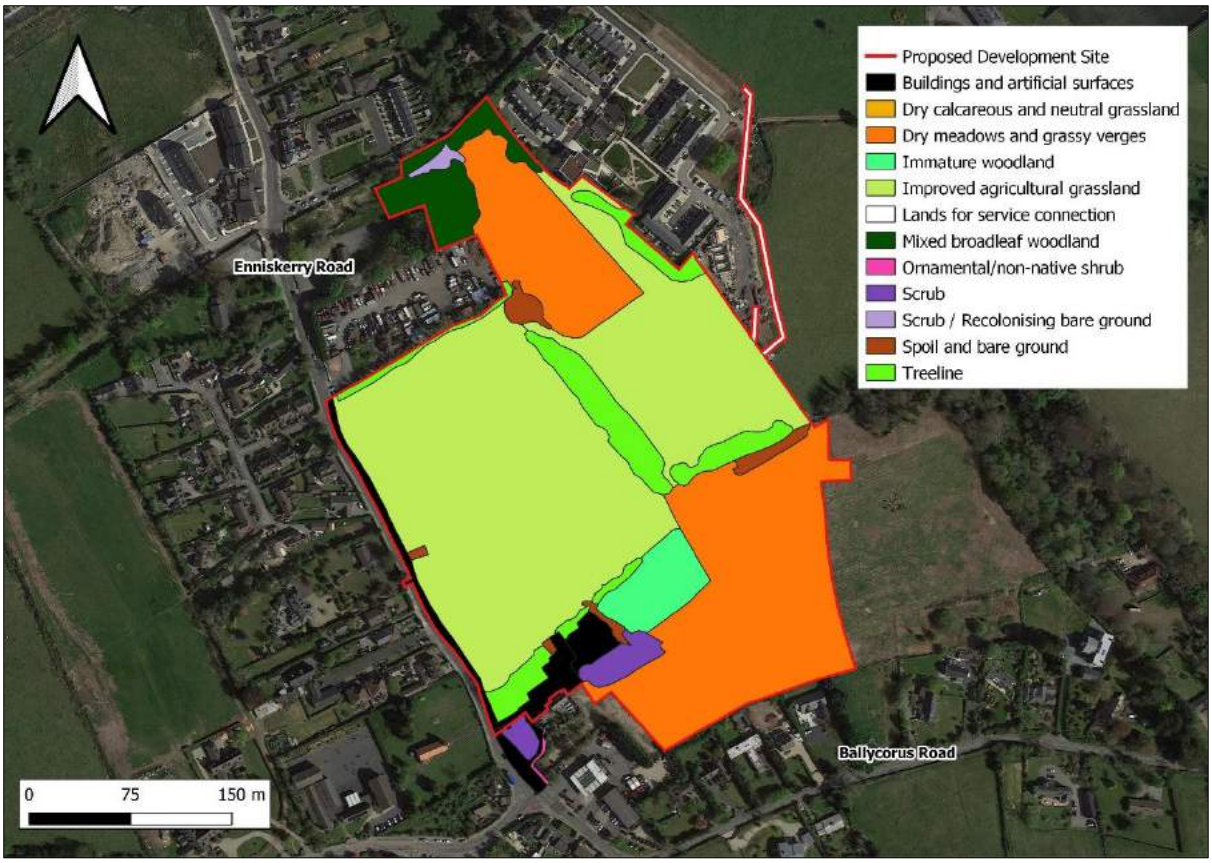

Figure 5-5: Habitats recorded within the Proposed Development site

The habitats within the Proposed Development site include:

- Dry meadows and grassy verges (GS2)
- Mixed broadleaf woodland (WD1)
- Treelines (WL2)
- Immature woodland (WS2)
- Improved agricultural grassland (GA1)
- Ornamental / /non-native shrub (WS3)
- Scrub (WS1)
- Recolonising bare ground (ED3)
- Spoil and bare ground (ED2)
- Buildings and artificial surfaces (BL3)

None of these habitats corresponds to Annex I habitats

5.3.2.1 Habitats of Local Importance (Lower Value)

Of the 10 habitat types recorded, seven are of local importance (lower value) due to their built structure, low diversity or managed nature. Although evaluated as local importance (lower value), some of these habitats may provide some use albeit limited, for local wildlife and habitat linkage purposes. This has been assessed within the relevant fauna sections of this Chapter.

Buildings and artificial surfaces (BL3) include all hardstanding areas, access roads, the existing disused 'Rockville' building and associated outbuildings with limited value for local biodiversity. Spoil and bare ground (ED2) includes areas that have been cleared of grassy vegetation or used to store rubble/debris and excavated material. Improved agricultural grassland (GA1) is improved and highly managed habitats within the Proposed Development site. They have a low species diversity and have limited botanical value. Certain areas of this habitat are actively used for cattle and as a result are heavily poached. A small patch of recolonising bare ground (ED3) is present where previously cleared areas are transitioning back to vegetated grassland. Sections of ornamental / non-native planting (WS3) are present along the driveway to the disused 'Rockville' house and the existing neighbouring property. Small patches of scrub (WS1), with limited botanical value are present throughout the Proposed Development site. The dominant scrub species noted within the Proposed Development site is *Rubus fruticosus* agg.. An immature woodland (WS2) of *Fraxinus excelsior* is located towards the southern end of the site. This plantation is low in species diversity with the understorey dominated by *Rubus fruticosus* agg., *Hedera helix* and *Urtica dioica.*

5.3.2.2 Habitats of Local Importance (Higher Value)

5.3.2.2.1 Dry meadows and grassy verges (GS2)

This habitat type is present within the northern and southern sections of the site. The most common species are the rank grass species such as *Dactylis glomerata* and *Holcus lanatus* and *Agrostis capillaris* with *Arrhenatherum elatius* also present. There are very few forb species present including *Ranunculus acris*, *Ranunculus repens*, *Plantago lanceolata*, *Chamerion angustifolium, Cirsium arvense*, *Taraxacum officinale* agg., *Trifolium pratense*, *Trifolium repens*, *Lathyrus pratensis*, *Vicia sepium* and *Rumex obtusifolius*.

A section of the dry meadows and grassy verges habitat, particularly in the southern portion shows evidence of poaching and graving by cattle.

Despite the overall low biodiversity value of the dry meadows and grassy verges habitat (i.e., dominated by rank grasses and limited forb species), this grassland is considered to be of local importance (higher value), due to its habitat potential, given the right management.

Plate 5-1: Dry meadows and grassy verges within the Proposed Development site

5.3.2.2.2 Treeline (WL2)

A number of treelines are present within the Proposed Development site boundary. A smaller treeline is present along the northern border of the site adjoining Boyle's coal yard and another is located behind the disused 'Rockville' building and associated outbuildings. A larger more substantial treeline runs through the centre of the site, from northwest to southeast. This treeline joins another which continues west to east. The most dominant species noted through these treelines include *Fagus sylvatica, Fraxinus excelsior, Quercus species, Acer pseudoplatanus, Corylus avellana* and *Sambucus nigra*.

This habitat is considered to be of local importance (higher value), as it forms part of the wider linear habitat network provides a valuable resource for the ecological connectivity of the lands to the surrounding wider area.

Plate 5-2: Central treeline within the Proposed Development site

5.3.2.2.3 Mixed broadleaf woodland (WD1)

Broadleaved woodland occurs along the northern boundary of the Proposed Development site. The broadleaved woodland is a mature stand of trees and includes the following tree species *Fagus sylvatica*, *Ulmus* sp., *Tilia* sp., *Fraxinus excelsior*., *Betula pendula and Quercus species*. Understorey vegetation includes *Hedera helix*, *Pteridium aquilinum*, *Rubus fructicosus* agg., holly *Ilex aquifolium* and *Urtica dioica*.

Overall, mixed broadleaved woodland within the Proposed Development site has been valued as local importance (higher value) due to the diversity this habitat provides in the wider landscape as well as the presence of mature established native tree species. Additionally, woodland habitat within the Proposed Development site provides a valuable resource for breeding birds, refuge for terrestrial mammals, and foraging and commuting habitat for bats.

5.3.3 Fauna

5.3.3.1 Terrestrial Mammals (excluding Bats)

5.3.3.1.1 Badger

Badger *Meles meles*, and their breeding and resting places, are protected under the Wildlife Acts. The NBDC database holds records for badger within *c.* 2km of theProposed Development site. The most recent NBDC record for badger is from *c*. 500m west of the Proposed Development site from 2011.

No evidence of badger activity or presence within the lands, including setts, snuffle holes or scat was recorded during the field surveys. The habitats present within the Proposed Development site, namely grassland and woodland, provide potential suitable habitat for badgers. Although no badger setts were identified within the Proposed Development site, given the suitability of the wider environs for badgers, a precautionary approach has been taken and the local badger population is valued to be of local importance (higher value).

5.3.3.1.2 Otter

Otter *Lutra lutra*, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011.

There were no signs of otter present within the site and there are no watercourses within the Proposed Development site. However, the Shanganagh River is located *c*. 306m from the Proposed Development site. The Carrickmines Stream, which is a tributary of the Shanganagh River (and located further downstream, separate from the Proposed Development is listed as being important for Otter (Macklin & Brazier, 2019), being one of the few remaining unculverted river systems in Dun Laoghaire-Rathdown County Council lands and containing a range of glides, pools and riffles, which are suitable for salmonid species: prey for Otter. In light of the above the Shanganagh River system is potentially important for otter and thus the Proposed Development site has been valued as local importance (higher value) with regard to otter.

5.3.3.1.3 Other small mammals

Small mammals, hedgehog *Erinaceus europaeus* and Pygmy Shrew *Sorex minutus* are both protected under the Wildlife Act, with records of both within 2km of the Proposed Development site.

No signs of small mammals were noted during the site surveys within the Proposed Development site in July 2021 or May 2022. However, the rank unmanaged grassland, scrub and woodland habitats within the Proposed Development site are suitable for the aforementioned species. These species are widespread and common in Ireland (Marnell *et al*., 2019). As such, the local small mammal populations are assessed as being of a local importance (higher value).

5.3.3.2 Bats

Bats, and their breeding and resting places, are protected under the Wildlife Acts. All bat species are also listed on Annex IV of the EU Habitats Directive (with the Lesser Horseshoe bat also listed on Annex II) and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011.

20 trees within the Proposed Development site were recorded as containing potential roost features (PRFs) for bats, which may include flaking bark, knot holes, cavities, broken limb and dense ivy cover. Their locations are shown on Figure 5-6 and details on these tree supporting PRFs are included in Appendix B of this EIAR.

Figure 5-6: PRF trees recorded within the Proposed Development site

At least four bat species were recorded over the extent of the Proposed Development site during dedicated bat activity surveys; Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, unknown bat species of the genus *Myotis* and Leisler's bats *Nyctalus leisleri*. A number of pipistrelle species *Pipistrellus* sp. calls were also recorded, that cannot be differentiated by analytical software as belonging to either Soprano Pipistrelle or Common Pipistrelle but as the frequency of the call falls between the thresholds for the two species, the calls cannot be identified to species level. Similarly, bat species of the genus Myotis are difficult to distinguish to species level based on call analysis and are therefore grouped together as 'bat species of the genus *Myotis*'. The locations of the bat calls recorded during the activity surveys are illustrated in Figure 5-7. All of the aforementioned bat species were recorded over the three survey nights, with Common Pipistrelle bat being the most commonly recorded species.

Figure 5-7: Bat activity noted within and adjacent to the Proposed Development site

At least five bat species were recorded on automated static bat detectors deployed within the Proposed Development site including; Leisler's bat, Common Pipistrelle bat, Soprano Pipistrelle bat, Brown Long-eared bat and unidentified *Myotis* bats[7]. At Location 1 (See Figure 5.2 for locations), located within the most eastern treeline running towards the woodland to

[7] Calls identified as belonging to species of the genus *Myotis* were recorded on automated detectors. Species of the genus *Myotis* which have been recorded in Ireland comprise Daubenton's bat *Myotis daubentonii*, whiskered bat *Myotis mystacinus*, Brandt's bat *Myotis brandtii* (albeit potentially as a vagrant only), and Natterer's bat *Myotis nattereri*. These species tend to exhibit similar call sonograms, which are often very difficult to differentiate with any accuracy. For this reason, these species have been assigned to genus level only.

the east of the site, all of the aforementioned species were recorded with Common Pipistrelle and Soprano Pipistrelle making up the majority of the calls. At Location 2, located within the treeline behind the 'Rockville' outbuildings only low numbers of Leisler's bat were recorded. At location 3, within the treeline running north west to south east across the site (a large number of bats were recorded commuting and foraging in this area with Common Pipistrelle being the most commonly detected accounting for 327 calls. Additionally, Leisler's bat was the second most common species with 94 calls. Details on the locations, of each static deployed is presented in Figure 5-2 of this Chapter.

Internal and external inspections of the buildings on site ('Rockville' and associated outbuildings) were conducted by Scott Cawley Ltd Ecologists in July 2021. 'Rockville' is disused and thus offers numerous potential roosting opportunities for bat species including window lintel gaps and gaps in the tile roof, despite this no sign of bat usage in this building was noted during the internal and external inspection on 1st July 2021. None of the outbuildings offer suitable roosting potential as they are either metal storage barns/ containers or are too exposed to the elements (i.e. no roof). Nonetheless these buildings were also inspected and no signs of bat usage were recorded.

Given the number of bat species recorded within the Proposed Development site and suitability of the site for foraging, commuting and roosting, the Proposed Development site has been valued as local importance (higher value) with regard bats.

5.3.3.3 Breeding birds

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive.

Four dedicated breeding bird surveys were carried out within the Proposed Development site on the 1st July 2021, 27th July 2021, 24th August 2021 and 13th June 2022. Most species recorded within or flying over the Proposed Development site during these surveys included green listed bird species including: Jackdaw *Corvus monedula*, Magpie *Pica pica*, Blackbird *Turdus merula*, Hooded Crow *Corvus cornix*, Woodpigeon *Columba palumbus*, Goldfinch *Carduelis carduelis*, Chaffinch *Fringilla coelebs*, Wren *Troglodytes troglodytes*, Blue Tit *Cyanistes caeruleus*, Robin *Erithacus rubecula*, Dunnock *Prunella modularis*, Coal Tit *Periparus ater* and Rook *Corvus frugilegus*.

Amber and red-listed birds as per the Birds of Conservation Concern in Ireland (BoCCI) Gilbert. et. al., (2021) list were also noted during these dedicated surveys and included Swallow *Hirundo rustica*, Starling *Sturnus vulgaris* House Martin *Delichon urbicum*, Goldcrest *Regulus regulus* and Herring Gull *Larus argentatus* all of which are amber listed bird species and Swift *Apus apus* which is a red-listed bird species.

Locations of species recorded within the Proposed Development site are included on Figure 5-8. All species recorded during the dedicated breeding bird surveys, and their breeding status within the Proposed Development site are outlined in Table 5-3.

Given the presence of amber and red listed bird species and availability of suitable nesting and foraging habitat, the Proposed Development site has been valued as local importance (higher value) with regard to breeding birds.

Figure 5-8: Breeding bird activity noted within and adjacent to the Proposed Development

Table 5-3: Breeding bird activity within the Proposed Development site

Common name	Scientific name	BoCCI[8]	Breeding status
Blackbird	*Turdus merula*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Woodpigeon	*Columba palumbus*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Swallow	*Hirundo rustica*	Amber-listed	Numerous birds recorded feeding and flying over the site. Not considered to breed within the site but potential nesting in nearby suitable buildings.
Wren	*Troglodytes troglodytes*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.

[8] Gilbert. *et. al.*, (2021)

Common name	Scientific name	BoCCI[8]	Breeding status
Blue tit	*Cyanistes caeruleus*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Chaffinch	*Fringilla coelebs*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Goldcrest	*Regulus regulus*	Amber-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Goldfinch	*Carduelis carduelis*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Herring Gull	*Larus argentatus*	Amber-listed	Recorded flying across the site. No breeding confirmed within the site.
House Martin	*Delichon urbicum*	Amber-listed	Numerous birds recorded feeding and flying over the site. Not considered to breed within the site but potential nesting in nearby suitable buildings.
Coal Tit	*Periparus ater*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Rook	*Corvus frugilegus*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Swift	*Apus apus*	Red-listed	Numerous birds recorded feeding and flying over the site. Not considered to breed within the site but in nearby suitable buildings
Dunnock	*Prunella modularis*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Jackdaw	*Corvus monedula*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Magpie	*Pica pica*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.

Common name	Scientific name	BoCCI[8]	Breeding status
Robin	*Erithacus rubecula*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Hooded Crow	*Corvus cornix*	Green-listed	Recorded throughout the site. No breeding confirmed but breeding is probable within the trees/ hedgerows across the site.
Starling	*Sturnus vulgaris*	Amber-listed	Recorded flying across the site and perched on overhead wires within the site. No breeding confirmed within the site.

5.3.3.4 Wintering birds

During the dedicated wintering bird surveys of 2021 and 2022, only very low numbers of Herring Gull, Curlew, Black-headed gull were recorded feeding within the Proposed Development site (see Figure 5-9). A peak count of 2 Herring Gull was recorded on one occasion (21.12.2021), a peak count of four Curlew was recorded on one occasion (23.11.2021) and a peak count of seven Black-headed Gull was recorded on one occasion (23.11.2021). No other SCI or QI species or their signs (e.g. feathers and droppings) for which European sites listed in Appendix B of this EIAR were observed or recorded during field surveys within the Proposed Development site. Herring gull are an SCI species of The Murrough SPA located *c.* 17.5km south east of the Proposed Development site. Curlew is an SCI of North Bull Island SPA located *c.* 12km northeast of the Proposed Development site and Black-headed Gull is an SCI of South Dublin Bay and River Tolka Estuary SPA located approximately 6.6km north of the Proposed Development site.

Due to the low numbers of Herring Gull, Black-headed Gull and Curlew recorded, and no evidence of usage by other SCI species, the Proposed Development site is not considered to support important numbers of SCI species associated with Dublin Bay or any other European sites. Furthermore, the majority of the Proposed Development site is dominated by areas of unmanaged grassland, scrub, treelines, recolonising bare ground and artificial surfaces and thus provides very low suitability for wetland and wader species. Therefore, this site does not represent an important inland *ex situ* site or habitat for wintering Herring Gull, Black-headed Gull or Curlew, or any other Special Conservation Interest (SCI) species. In light of the above the Proposed Development site is assessed as being of local importance (lower value) for wintering birds.

Figure 5-9: Wintering bird noted within the Proposed Development site

5.3.4 Summary of Ecological Evaluation

Table 5-4 summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and NRA guidelines (CIEEM, 2018 and NRA, 2009).

Table 5-4: Ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identification of the Key Ecological Receptors (KERs).

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
Rockabill to Dalkey Island SAC	International	**Yes**
Dalkey Island SPA	International	**Yes**
Loughlinstown Wood pNHA	National	**Yes**
Dalkey Coastal Zone and Killiney Hill pNHA	National	**Yes**
All other SAC or SPA sites	International	No
All other NHA or pNHA sites	National	No
Habitats		
Dry meadows and grassy verges (GS2)	Local importance (higher value)	**Yes**
Immature woodland (WS2)	Local importance (lower value)	No
Improved agricultural grassland (GA1)	Local importance (lower value)	No
Recolonising bare ground (ED3)	Local importance (lower value)	No
Treelines (WL2)	Local importance (higher value)	**Yes**
Scrub (WS1)	Local importance (lower value)	No
Ornamental/non-native shrub (WS3)	Local importance (lower value)	No
Buildings and artificial surfaces (BL3)	Local importance (lower value)	No
Spoil and bare ground (ED2)	Local importance (lower value)	No
Mixed broadleaf woodland (WD1)	Local importance (higher value)	**Yes**
Fauna Species		
Otter	Local importance (higher value)	**Yes**
Breeding birds	Local importance (higher value)	**Yes**
Badgers	Local importance (higher value)	**Yes**
Other small mammals	Local importance (higher value)	**Yes**
Bats	Local importance (higher value)	**Yes**

Wintering birds	Local importance (lower value)	No

5.4 Characteristics of the Proposed Development

5.4.1 Proposed Development

A full description of the proposed Strategic Housing Development is provided in Chapter 2 of this EIAR. Briefly, to summarise those characteristics of relevance to biodiversity, the development will consist of the following elements:

- the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings;
- the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre, which will provide a creche (439 sq m), office (317 sq m), medical (147 sq m), retail (857 sq m), convenience retail (431 sq m) and a community facility (321 sq m). The 383 No. residential units will consist of 27 No. 1 bedroom units (19 No. apartments and 8 No. duplexes), 128 No. 2 bedroom units (78 No. apartments and 50 No. duplexes), 171 No. 3 bedroom units (108 No. houses, 3 No. apartments and 60 No. duplexes) and 57 No. 4 bedroom units (57 No. houses);
- 678 No. car parking spaces (110 No. in the undercroft of Blocks C and D and the Neighbourhood Centre and 568 No. at surface level) including 16 No. mobility impaired spaces, 73 No. electric vehicle spaces, 1 No. car share space, 4 No. drop-off spaces/loading bays;
- motorcycle parking;
- bicycle parking;
- bin storage;
- the decommissioning of the existing telecommunications mast at ground level and provision of new telecommunications infrastructure at roof level of the Neighbourhood Centre including shrouds, antennas and microwave link dishes (18 No. antennas and 6 No. transmission dishes, all enclosed in 9 No. shrouds together with all associated equipment);
- private balconies, terraces and gardens;
- hard and soft landscaping;
- sedum roofs, solar panels; and
- and all other associated site works above and below ground.

In addition to the above the Proposed Development will also include pedestrian links from Enniskerry Road and within the site to the neighbouring "Rockville" development to the north-east and a pedestrian/cycle route through the Dingle Way from Enniskerry Road to the future Glenamuck Link Distributor Road.

Road works are also proposed to facilitate access to the development from the Enniskerry Road; to the approved Part 8 Enniskerry Road/Glenamuck Road Junction Upgrade Scheme on Glenamuck Road (DLRCC Part 8 Ref PC/IC/01/17); and to the approved Glenamuck

District Roads Scheme (GDRS) (ABP Ref:HA06D.303945) on the Glenamuck Link Distributor Road (GLDR). Drainage and water works are also proposed to connect to services on the Glenamuck Road and Enniskerry Road.

At the Glenamuck Road access point, this will include works, inclusive of any necessary tie-ins, to the footpath and cycle track to create a side road access junction incorporating the provision of an uncontrolled pedestrian crossing across the side road junction on a raised table and the changing of the cycle track to a cycle lane at road level as the cycle facility passes the side road junction. These interfacing works are proposed on an area measuring 0.05 Ha.

At the GLDR access point, this will include works, inclusive of any necessary tie-ins, to the footpath and cycle track to create a side road access junction incorporating the provision of short section of shared path and an uncontrolled shared pedestrian and cyclist crossing across the side road junction on a raised table. The works will also include the provision of a toucan crossing, inclusive of the necessary traffic signal equipment, immediately south of the access point to facilitate pedestrian and cyclist movement across the mainline road. All works at the GLDR access point will include the provision of the necessary tactile paving layouts and are provided on an area measuring 0.06 Ha.

At the Enniskerry Road, works are proposed to facilitate 3 No. new accesses for the development along with modifications to Enniskerry Road. The 3 No. side road priority access junctions incorporate the provision of an uncontrolled pedestrian crossing across the side road junction on a raised table. The modifications to Enniskerry Road fronting the development (circa 320 metres) includes the narrowing of the carriageway down to 6.5 metres (i.e. a 3.25 metres running lane in each direction) from the front of the kerb on western side of Enniskerry Road. The remaining former carriageway, which varies in width of 2 metres, will be reallocated for other road users and will include the introduction of a widened pedestrian footpath and landscaped buffer on the eastern side of the road adjoining the Proposed Development. The above works are inclusive of all necessary tie-in works such as new kerb along eastern side of Enniskerry Road, drainage details, road marking, signage and public lighting. Potable water is to be provided from the existing piped infrastructure adjacent to the site along the Enniskerry Road. The interface works on Enniskerry Road measures 0.19 Ha.

Surface water

The surface water infrastructure has been divided into two catchment areas. One large (9.63Ha drained area) and one small (0.29Ha drained area).

The larger catchment will flow into the existing piped infrastructure constructed in the existing Rockville development (D17A/0793) to the NE of the Proposed Developmentsite. The smaller catchment of the Proposed Development (apartment Blocks C & D) will outfall into the surface water drainage infrastructure to be provided as part of the GDRS project in Glenamuck road. The surface water drainage connection spur into the GDRS infrastructure has been agreed with the DLRCC GDRS project office and is incorporated into that road project.

All surface waters from the Proposed Development site will ultimately drain into the Shanganagh River and then into Killiney Bay.

Sustainable Drainage System (SuDS) measures being proposed within the Proposed Development site include:

- Filter drains to the rear of the housing
- Permeable paving to all private parking areas
- Rainwater butts (200l) to the rear downpipes of the houses
- Filter Swales (13No.) adjacent to roadways where feasible
- Tree pits (2No.) where practically feasible
- Use of the existing central dry ditch as a drainage swale
- Bio-Retention area
- Silt-trap/catchpit manholes
- Hydrobrakes limiting flow to the drained area Qbar greenfield rate
- Petrol interceptors upstream of all outfall points
- Stone lined voided arch retention storage devices

Foul water

The Proposed Development will result in an overall increase of 1514 P.E. (population equivalent) foul effluent generated from the site.

The proposed foul outfall from 10.5 Ha of the Proposed Development site will be via the existing piped foul drainage system constructed as part of the Rockville schemes (D17A/0793 and D18A/0566). This existing infrastructure in turn outfalls downstream into the existing Irish Water owned 300mm foul drainage piped infrastructure on Glenamuck Road. Located in the northeast corner of the Proposed Development site, approximately 0.3 Ha of the Proposed Development (apartment Blocks C & D) will outfall the localised foul flow into the foul drainage infrastructure to be provided as part of the GDRS project in Glenamuck road. The foul drainage connection spur from the GDRS infrastructure has been agreed with the DLRCC GDRS project office and is incorporated into that road project.

From there, foul effluent will be transferred to Shanganagh-Bray Wastewater Treatment Plant (WWTP) for treatment prior to discharge to Killiney Bay. The Shanganagh WwTP is currently operating at under its capacity of 186,000 PE, with a current peak week loading of 129,335 PE. The Shanganagh WwTP is compliant with the Emission Limit Values (ELV's) set in the Wastewater Discharge Licence.

5.5 Potential Impact of the Proposed Development

As per the relevant guidelines, likely significant effects have only been assessed for KERs, as listed in Table 5-4. An effect is considered to be ecologically significant if it is predicted to affect the integrity or conservation status of a KER at a specified geographical scale. All effects are described in the absence of mitigation.

5.5.1 Construction Phase

5.5.1.1 Construction Phase Impacts on Designated Sites

This section describes and assesses the potential for the Proposed Development to result in likely significant effects on designated areas for nature conservation at SACs, SPAs, NHAs or

pNHAs. In the context of European sites this is focussed on the habitats and species for which the sites are selected (QIs for SACs and SCIs for SPAs) and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented in the Appropriate Assessment Screening Report prepared for the Proposed Development.

In the case of NHAs and pNHAs the assessment considers whether the integrity of any such site would be affected by the proposed Strategic Housing Development with reference to the ecological features for which the site is designated or is proposed.

5.5.1.1.1 European Sites

The Appropriate Assessment Screening Report (Scott Cawley Ltd, 2022) accompanying this Planning Application has identified the European sites within the potential zone of influence of the Proposed Development. Surface water drainage and foul waters from the Proposed Development site will ultimately discharge to Killiney Bay via the separate surface and foul water sewer networks surrounding the site and Shanganagh WwTP. The European sites potentially impacted are Rockabill to Dalkey Island SAC and Dalkey Island SPA. In the case of the two European sites, likely significant effects could potentially arise from potential construction and/or operation related surface/foul water discharges from the Proposed Development site and the potential for these effects to reach the downstream European sites. The assessment presented in the Appropriate Assessment Screening Report concluded that the potential impacts associated with the Proposed Development do not have the potential to affect the receiving environment and, consequently, do not have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of any European sites. This is in light of the following reasons:

Considering the following, the Proposed Development will not have any measurable effects on water quality in Killiney Bay or the Southwestern Irish Sea:

- The small scale of the proposed works relative to the receiving surface water network;
- The relatively low volume of any surface water run-off or discharge events from the proposed works site relative to the receiving surface water and marine environments (which will be retained, attenuated, diluted and dispersed near source area);
- There is no direct pathway via surface runoff (open water courses) to any water body;
- The level of mixing, dilution and dispersion of any surface water run-off/discharges from the Proposed Development site in the receiving watercourses, Killiney Bay and the Irish Sea.

Therefore, there is no possibility of the Proposed Development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Killiney Bay as a result of surface water run-off or discharge.

5.5.1.1.2 Nationally Designated Sites

As outlined within Section 5.3.1.2 of this Chapter, the zone of influence of the Proposed Development in relation to designated sites extends to NHAs/pNHAs and European sites downstream of the Proposed Development in Shanganagh River and its tributaries and to

European sites in Killiney Bay. Therefore, the only nationally designated sites within the potential zone of influence of the Proposed Development are Loughlinstown Woods pNHA (001211) and Dalkey Coastal Zone and Killiney Hill pNHA (001206). These designated sites are either located within close proximity or in the downstream receiving environment within the Southwestern Irish Sea – Killiney Bay Coastal Waterbody[9], to which the surface waters from the lands ultimately discharge via the Shanganagh River.

Notwithstanding the location of the aforementioned designated sites in the downstream receiving environment, there is not considered to be any potential for significant effects arising from the construction or operation of the Proposed Development on these nationally designated sites for the same reasons as European sites above, in addition to the reasons outlined below:

Loughlinstown Wood pNHA (001211)

The Proposed Development is located upstream of this nationally designated site, which is known to support an area of EU priority Annex I habitat [91E0] alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) (or alluvial woodland). It is not clear from the site synopsis for this designated site whether alluvial woodland is a reason for designation of the site, however it has been treated as such on a precautionary basis. According to most recent Article 17 reporting on EU Annex I habitats, the main threats and pressures facing Alluvial woodland in Ireland are from invasive alien species, problematic native species, and clear-cutting or removal of trees (NPWS, 2019a and 2019b). As mentioned above, the proposal does not traverse Loughlinstown Woods pNHA, and therefore there is no potential for significant effects to arise from direct habitat loss (e.g. tree removal) or fragmentation impacts.

Alluvial woodland habitat is characterised by a regime of periodic high-water flooding. While in theory, and in the absence of any mitigation, there is potential for contaminated discharges (e.g. leaks or spills of hydrocarbons from plant, release of cementitious materials) to surface or ground waters to reach the woodland (e.g. during or immediately after a storm event when elevated river levels result in flooding of the woodland), no significant effects are anticipated on alluvial woodland habitat. This conclusion has been reached in light of the following:

- The distance between the area of construction works and alluvial woodland habitat
- The dilution factor in the receiving groundwater body and the Shanganagh River and its tributaries
- A contamination event would have to coincide with a period of high water, which is considered to be unlikely.
- The limited scale of the proposal and the distance between the Proposed Development and the surface water network.

9 Based on interrogation of spatial data on Water Features, including sub basins, and coastal waterbodies, held by the EPA and available for review on the EPA MapViewer www.epa.ie

Dalkey Coastal Zone and Killiney Hill pNHA (001206)

A small area of the Dalkey Coastal Zone and Killiney Hill pNHA (001206) is located at the outfall of the Shanganagh River to Killiney Bay, corresponding to an area of shingle beach and drift banks[10]. This site has been designated for its "fine example of a coastal system with habitats ranging from the sublittoral to coastal heath" (NPWS, 2009b). As mentioned above, the proposal does not traverse Dalkey Coastal Zone and Killiney Hill pNHA, and therefore there is no potential for significant effects to arise from direct habitat loss or fragmentation impacts.

Based on a review of water quality data for Killiney Bay available from the EPA mapviewer, the Southwestern Irish Sea – Killiney Bay coastal waterbody is currently listed as 'Unpolluted'. While any potential release of sediments and/or pollutants (such as hydrocarbons) during construction and/or operation of the Proposed Development could theoretically affect water quality in the receiving surface water environment, there is no likelihood of any perceptible effect on water quality in Killiney Bay. This is because there is a large distance of separation between the Proposed Development and Killiney Bay and potential for pollution to be dissipated in the drainage network.

The Southwestern Irish sea – Killiney Bay is currently unpolluted, and the Proposed Development will not result in any measurable effect on water quality in Killiney Bay. There are also protective policies and objectives in place at a strategic planning level, within the functional areas of Dún Laoghaire-Rathdown (Dún Laoghaire-Rathdown County Council, 2022) and Wicklow County (Wicklow County Council, 2016), to protect water quality in Killiney Bay.

Therefore, the Proposed Development will not result in significant effects on nationally designated sites at any geographic scale.

5.5.1.2 Construction Phase Impacts on Habitats

5.5.1.2.1 Habitat loss

Dry meadows and grassy verges (GS2) habitat will be entirely removed to accommodate the Proposed Development. However, given the relatively low species diversity recorded in this habitat, the current management of the land (i.e. active cattle grazing) and the proposed landscaping which will include a mixture of wildflower meadows and seasonal bulbs the loss of this habitat is not likely to result in a significant negative effect, at any geographic scale.

The Proposed Development will result in the loss of some treelines across the development site. However, the majority of treelines within and on the periphery of the Proposed Development site are being retained, especially the more established treelines including the treeline running from northwest to southeast through the centre of the site. Additionally, extensive landscape planting including new native trees, shrub and groundcover herbaceous

[10] Based on a review of orthophotography of the designated site from google maps www.google.com/maps Accessed 10th December 2019.

planting and wildflower meadows is outlined as part of the Proposed Development. The proposed landscape planting will reduce the long-term effect of habitat loss arising from the Proposed Development.

It is proposed as part of the Proposed Development to retain the mixed broadleaf woodland within the northern section of the site, thus there are no impacts on woodland habitats with regard habitat loss during construction.

5.5.1.2.2 Damage to retained vegetation

In the absence of any mitigation, there is potential for damage to areas of treelines and woodland marked for retention. While sections of these habitats are being retained within the Proposed Development, there remains a risk of damage to the habitats arising during construction such as driving vehicles and storing materials within tree root protection zones, or through accidental machinery strikes to branches or trunks of trees. This impact, in a worst-case scenario could result in damage and degradation of trees, and ultimately death of individual trees. This impact would be significant at a local geographic scale and the duration of impact would be long-term.

5.5.1.3 Construction Phase Impacts on Otter

5.5.1.3.1 Habitat loss

No aquatic habitats were identified within the Proposed Development site therefore there will be no loss of aquatic or suitable riparian/terrestrial foraging habitat due to the Proposed Development. Also, during the multidisciplinary survey, no signs of Otter were identified within the Proposed Development site. Therefore, the Proposed Development will not result in a significant negative effect, with regard habitat loss for otter, at any geographic scale.

5.5.1.3.2 Disturbance/displacement

Increased human presence and/or noise and vibration during construction or operation, has the potential to displace otter from foraging habitat. However, considering the lack of aquatic habitats within the Proposed Development site and the distance between the Shanganagh River and the Proposed Development site, significant displacement of otter from foraging areas is unlikely to affect the local otter population. Thus, the Proposed Development will not result in significant negative effects, at any geographic scale.

5.5.1.3.3 Effects of water quality impacts

In the absence of any mitigation, surface water run-off generated during construction could potentially carry silt, oils or other contaminants into the local surface water network which discharges to the Shanganagh River. Given the lack of suitable aquatic habitats within the Proposed Development site and the distance between the Proposed Development site and the local surface water network, any effects on prey abundance will not be discernible. Therefore negative effects on otter are not likely to be significant at any geographic scale.

5.5.1.4 Construction Phase Impacts on Badger

5.5.1.4.1 Habitat loss

Construction will result in the permanent loss of badger foraging habitat within the Proposed Development site. As outlined in Section 5.3.3, no signs of badger including setts (underground resting places) or feeding signs were observed across the Proposed Development site. Notwithstanding the absence of any signs of badger, given the variety of habitats and suitability of the site for badger, a precautionary approach has been adopted and it has been assumed that badgers use the Proposed Development site on occasion for foraging.

Although badger activity may be altered by the Proposed Development, it is anticipated that badgers will continue to forage across retained habitats, and newly created habitats (e.g. suburban gardens, linear parks and green spaces) following construction of the Proposed Development. Additionally, the Proposed Development site is surrounded in the wider landscape by agricultural lands, hedgerows, treelines, etc., all of which provide suitable commuting and foraging habitat for badger. In light of the above, it is predicted that the loss of foraging habitat associated with the Proposed Development is unlikely to affect the conservation status of the local badger population and will not result in a likely significant negative effect, at any geographic scale.

5.5.1.4.2 Disturbance/displacement

Increased human presence and/or noise and vibration during construction or operation, has the potential to displace badgers from foraging habitat. However, considering the lack of evidence of any badger activity recorded within the Proposed Development site and that the majority of human disturbance/noise will typically be undertaken during normal daylight hours and badgers are nocturnal in habit, significant displacement of badgers from foraging areas unlikely to affect the local badger population.

Nocturnal mammals, such as the badger, are likely to be disturbed by the introduction of artificial light into foraging areas (Rich & Longcore, 2005) which could affect use of foraging areas. Disturbance or displacement due to light effects could occur during construction. However, the retention of woodland along the northern boundary and treelines throughout the centre of the site would act as a visual buffer which will provide a visual barrier between these areas of the site and works area during construction. However, it is possible that temporary lighting required during the construction stage of the Proposed Development may illuminate previously unlit feeding and/or commuting areas, e.g. areas away from woodland retention areas making them unsuitable for badgers. However, any effects associated with artificial lighting during construction of the Proposed Development, is likely to be temporary and confined to specific areas within the site.

It is therefore predicted that displacement/disturbance effects associated with increased human presence and/or noise and vibration and artificial light spill is unlikely to affect the conservation status of the local badger population and will not result in significant negative effect, at any geographic scale.

5.5.1.5 Construction Phase Impacts on Other small mammals

5.5.1.5.1 Habitat loss

The majority of the Proposed Development site consists of unmanaged grassland, treelines, scrub and woodland with potentially suitable habitat to support small mammal species, such as pygmy shrew or hedgehog. Given the relatively low numbers of individuals of each species that are likely to be affected, and that they are highly mobile species, site clearance is unlikely to result in a level of mortality that would affect the species' conservation status, and result in a significant negative effect, even at a local geographic scale.

5.5.1.5.2 Disturbance/displacement

In conjunction with any displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace mammal species from both breeding/resting places and from foraging habitat. However, considering that disturbance will be short-term, it is extremely unlikely to result in any long-term effects on the local mammal population or their conservation status. Particularly considering the extensive planting outlined within the landscaping design, the retention of woodland and treelines as outlined within the landscaping plan prepared for this application and the abundance of alternative suitable habitat of a similar nature surrounding the Proposed Development site. Therefore, disturbance/displacement is unlikely to result in a significant negative effect, at any geographic scale.

5.5.1.6 Construction Phase Impacts on Breeding Birds

5.5.1.6.1 Habitat loss

The clearance of vegetation within the lands will result in the permanent loss of foraging and nesting habitats for birds. This includes scrub, treeline and woodland habitats utilised by a range of common bird species. However, there is alternative suitable foraging/breeding habitat, including hedgerows, woodlands and treelines located in the vicinity of the Proposed Development site as well as within the areas of woodland and treelines to be retained as part of the landscaping proposal. All of this will be sufficient to maintain the local population in the long-term. Additionally, the majority of birds recorded within the Proposed Development site include a range of common bird species, which occur in suburban settings throughout the Dublin area. It is likely that they will continue to utilise the Proposed Development site following completion of construction. It is therefore predicted that, despite any temporary effects, the loss of foraging/breeding habitat associated with the Proposed Development the effects of habitat loss are not significant at any geographic scale.

5.5.1.6.2 Direct mortality

All birds, their nests, eggs and unfledged young are protected in Ireland through the Wildlife Acts. In the absence of any mitigation, there is potential for clearance of vegetation to result in mortality of birds or their young, or the destruction of a nest. This would most likely occur if site preparation works were to be undertaken during the breeding bird season, i.e. between 1st March and 31st August. The effects of mortality or loss of a nest for all breeding birds would have a significant negative effect at the local geographic scale.

5.5.1.6.3 Disturbance/displacement

There is likely to be an increase in noise and human presence within the Proposed Development site during construction and operation which is likely to displace breeding birds from habitat areas within and adjacent to the Proposed Development boundary. Although it is not possible to quantify the magnitude of this potential impact (or the potential effect zone) it could potentially extend for several hundred metres from the Proposed Development. Given the nature of the surrounding environment, the existing level of noise and disturbance in the immediate vicinity of the proposed works (especially associated with the on-going Rockville development) and given that the majority of bird species recorded on the Proposed Development site, and likely to breed there, are common urban species, they are anticipated to continue breeding and utilising lands in and adjacent to the Proposed Development site. For these reasons, significant negative effects arising from disturbance or displacement are not predicted.

5.5.1.7 Construction Phase Impacts on Bats

5.5.1.7.1 Direct mortality

Bats, and their breeding and resting places, are strictly protected under the Birds and Habitats Regulations, and under the Wildlife Acts, and it is an offence under that legislation to intentionally kill or injure bats or to interfere with or destroy their breeding or resting places. No evidence of roosting bats was noted within the lands during the dedicated surveys in July 2021 or May 2022. However, a disused building 'Rockville' and multiple trees (outlined on Figure 5-6) within the Proposed Development site were deemed to have suitability for roosting bats due to the evidence of potential roost features that could accommodate small numbers of bats. As part of the Proposed Development, it is proposed to demolish the disused 'Rockville' building and remove some of the trees identified as PRFs. As such, there is the potential for bats roosting in this structure or trees to be injured or killed during demolition, renovation or site clearance works. Therefore, mitigation measures are included to ensure that building demolition works or vegetation clearance does not result in bats being accidentally killed or injured during construction.

5.5.1.7.2 Habitat loss

The loss of woodland and treeline habitat will result in the permanent loss of foraging habitat for bat species within the Proposed Development site. However, there is alternative suitable foraging habitat located in the agricultural lands surrounding the Proposed Development site and within the areas of woodland and treelines to be retained as part of the landscaping proposal for the development, all of which are likely to be sufficient to maintain the local population in the long-term.

It is therefore predicted that, despite any temporary effects, the loss of foraging/commuting habitat associated with the Proposed Development is unlikely to affect the conservation status of the local bat population and will not result in a likely significant negative effect, at any geographic scale, especially considering that the most frequently recorded species- common pipistrelle, soprano pipistrelle and Leisler's bat, are known to have a widespread distribution across the region, and in Ireland (Roche *et al.,* 2014) and that these species are showing an increase in their population trend.

5.5.1.7.3 Disturbance/displacement

Light levels are not anticipated to increase significantly during the construction phase of the proposal, as works will be largely confined to daylight hours, and therefore there will not be a requirement for long-term lighting of the Proposed Development site which could affect suitable bat foraging habitat in the vicinity. It is proposed to retain areas of woodland and treelines within the site which will provide a visual barrier between these areas of the site and any works areas that require lighting during construction. However, it is possible that temporary lighting required during the construction stage of the Proposed Development may illuminate previously unlit feeding and/or commuting areas, e.g. areas away from retained habitats making them unsuitable for bats. However, any effects associated with artificial lighting during construction of the Proposed Development, are likely to be temporary and confined to specific areas within the site. Additionally, the most common species recorded within the subject lands i.e. Leisler's bat, soprano pipistrelle and common pipistrelle bat are some of the least sensitive species to artificial light spill. For these reasons, disturbance / displacement impacts during construction will not be significant at any geographic scale.

5.5.2 Operational Phase

5.5.2.1 Operational Phase Impacts on Designated Sites

5.5.2.1.1 European Sites

The proposed foul outfall from 10.5Ha of the Proposed Development site will be via the existing piped foul drainage system constructed as part of the Rockville schemes (D17A/0793 and D18A/0566). This existing infrastructure in turn outfalls downstream into the existing Irish Water owned 300mm foul drainage piped infrastructure on Glenamuck Road. Located in the northeast corner of the Proposed Development site, approximately 0.3 Ha of the Proposed Development (apartment Blocks C & D) will outfall the localised foul flow into the foul drainage infrastructure to be provided as part of the GDRS project in Glenamuck road. From both locations, foul water will be transferred to Shanganagh WwTP for treatment prior to discharge into Killiney Bay. The Proposed Development is anticipated to result in an additional foul water loading value of 1514 P.E. to Shanganagh WwTP. The Shanganagh WWTP is currently operating under its capacity of 186,000, with a current loading of 129,335 P.E. The Shanganagh WwTP is compliant with the limits set out in its licence and its discharge is not having an observable negative impact on water quality in Killiney Bay (Irish Water, 2020).

Considering the above, particularly the current 'high' WFD status of Killiney Bay, the Proposed Development will not have any perceptible impact on water quality of Killiney Bay.

Therefore, there is no possibility of the Proposed Development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Killiney Bay as a result of foul water discharges.

Therefore, the Proposed Development will not adversely affect (either directly or indirectly) the integrity of any European site.

5.5.2.1.2 Nationally Designated Sites

There are no nationally designated sites within the potential zone of influence of any operational phase outputs from the Proposed Development, e.g. they are not within the ZoI of foul water discharges from the site. With regards to Loughlinstown Wood pNHA, it is located upstream of the discharge point from the Shanganagh WwTP. With regards to the Dalkey Coastal Zone and Killiney Hill pNHA, it has been designated for high-water mark habitats (e.g. shingle banks) which are not vulnerable to any potential nutrient deposition arising from increases in foul water loading to Shanganagh WwTP. For these reasons, there is no possibility of significant negative effects on Nationally designated sites arising from the Proposed Development.

5.5.2.2 Operational Phase Impacts on Habitats

There are no operational phase impacts predicted for habitats arising from the Proposed Development.

5.5.2.3 Operational Phase Impacts on Otter

No operational phase impacts are predicted on otter as a result of the Proposed Development.

5.5.2.4 Operational Phase Impacts on Badgers

5.5.2.4.1 Disturbance/displacement

The Proposed Development has the potential to displace badgers from foraging habitat during operation given the loss of territory and the increased number of people likely to be using the Proposed Development site during operation. However, considering the extent of planting proposed within the landscaping plan, the retention of periphery woodland and central treelines and that the majority of human disturbance/noise will typically be undertaken during normal daylight hours and badgers are nocturnal in habit, significant displacement of badgers from foraging areas (outside of areas where foraging habitat will be lost as a result of the Proposed Development) is considered unlikely to affect the local badger population

Disturbance or displacement due to light effects could occur during operation. However, as outlined within the landscaping proposals accompanying this application, planting of native woodland shrubs/trees such as hawthorn *Crataegus monogyna* will be established within the site, which along with minimising the requirement for maintenance machinery (i.e. lawnmowers), will provide a level of screening from residential dwellings and artificial light spill, which will reduce the levels of disturbance to foraging badgers using the Proposed Development site. This will be further enhanced through the retention of woodland and treelines throughout the Proposed Development site as outlined on the landscaping plan prepared for this application.

5.5.2.5 Operational Phase Impacts on Other small mammals

There are no operational phase impacts predicted with regard small mammals arising from the Proposed Development at any geographic scale. This is because small mammal species are retiring by nature and are anticipated to continue utilising suitable foraging habitats in

peripheral parts of the Proposed Development site and surrounding area at the operational phase of the Proposed Development.

5.5.2.6 Operational Phase Impacts on Breeding Birds

The planting proposed as part of the landscape design for the site will, as it becomes established, serve to provide additional nesting and foraging opportunities for the local bird population, thus no operational phase impacts are predicted with regard loss of habitat for breeding birds. Although there will be an increase in noise and human presence within the Proposed Development site during operation, the majority of birds recorded within the Proposed Development site, and likely to breed there, are common urban species and thus it is likely that bird species will adapt to human presence within the Proposed Development site.

The presence of new multi-storey structures within the Proposed Development site could potentially result in direct mortality of bird species that utilise the site for foraging and/or commuting, through collisions.

From a review of available literature on the subject, bird collisions with man-made structures are common and well documented (Banks, R.C., 1979), (Jenkins, et al., 2010), (Klem, D., 1990), (Erickson, et al., 2005), (Erickson, et al., 2001) with migratory passerine species the most prevalent collision victims (Bing *et al.,* 2012) (Longcore *et al.,* 2013). Bird collision with buildings is generally associated with reflective material such as windows or large surfaces of glass which create a mirror and appear to show the continuation of the sky or surrounding landscape, an effect that can be exacerbated by lighting (Sheppard, C. & Phillips, G., 2015). Whilst the design of the facades of the apartments and neighbourhood centre buildings do include windows, as shown on the elevation drawings prepared by Mc Crossan O Rourke Manning Architects for the proposed development no large surfaces of glass are proposed. Rather the external surfaces of the buildings will be a combination of brickwork and pressed metal cladding.

The use of different materials and design in the facades and elevations will minimise the effect of glazing, making the building more detectable to birds and therefore reduce the potential for collisions to occur. In the absence of mitigation there could be a low level of mortality attributable to bird collision with glazing on the proposed buildings, however this impact is unlikely to cause any significant effect at a local scale or any other geographic scale.

With respect to Special Conservation Interest (SCI) species for SPAs within the zone of influence of the proposed development which regularly use or travel over inland areas (i.e. light bellied brent goose, gull species, duck species and a number of waders such as oystercatcher, godwit species or curlew), in Dublin they navigate the urban environment with built structures daily. To put some context on some of their avoidance capabilities, in a different setting and for use in collision risk modelling for onshore wind turbines, an avoidance rate of 99.5% is applied for large gull species and an avoidance rate of 99.2% is applied for small gull species (Furness, 2019), which essentially means that 99.5% and 99.2% of gull flights, respectively, will avoid collision with a moving turbine. For Curlew the avoidance rate applied is 98% (SNH, 2018). The risk of collision is even less with a static, clearly detectable building. The proposed buildings consist of glazing, broken up with other cladding and material finishes. While the presence of the proposed development might alter flight patterns of bird species slightly to avoid the proposed building structures the risk of collision is extremely low.

Considering the low collision risk associated with the species in question, in combination with the building location, design and materials used, the potential for collision risk for birds it low. It is however acknowledged that there could be a low level of mortality attributable to bird collision with glazing on the proposed buildings. This impact however would not result in any population level effect or change in distribution of any species, including any SCI species for SPAs within the zone of influence of the proposed development.

5.5.2.7 Operational Phase Impacts on Bats

An increase in the existing light levels during operation, within and adjacent to the Proposed Development site could potentially indirectly affect bat species that utilise the site for foraging and/or commuting.

Given the presence of lighting in the immediate surrounding environment (i.e. within the on-going Rockville development to the northeast) and street lighting along the surrounding roads including the Glenamuck Road and the Enniskerry Road, the local bat population would be expected to be habituated to artificial light spill, especially as the most common species recorded within the Proposed Development site i.e. Leisler's bat, Soprano pipistrelle and Common pipistrelle bat are some of the least sensitive species to artificial light spill, and are recorded in towns and cities across Ireland.

Additionally, following a review of the operational lighting plan prepared for the Proposed Development by Sabre Lighting, artificial light has been minimised and where possible avoided for areas of high bat activity e.g. the northern woodland to be retained and central treelines to be retained. No lighting has been proposed for the northern area of broadleaf woodland and lighting within the treeline to be retained will consist of low level, bollard lighting with uplighting sources kept to a minimum to reduce sky glow/light dispersal.

In light of the existing habitats within the lands, the range of species utilising the lands, and the design measures adopted for lighting of the Proposed Development site, significant effects arising from disturbance or displacement of bats are not anticipated to be significant at any geographic scale.

The presence of new multi-storey structures within the Proposed Development site could potentially result in direct mortality of bat species that utilise the site for foraging and/or commuting, through collisions.

Recent studies, investigating the cause of bat collisions with buildings found that building material is an important factor to be considered (Greif *et al*., 2017) and that smooth vertical surfaces such as glassy exteriors and windows can be problematic (Timm, 1989). Whilst the design of the facades of the apartments and neighbourhood centre buildings do include windows, as shown on the elevation drawings prepared by Mc Crossan O Rourke Manning Architects for the proposed development no large surfaces of glass are proposed. Rather the external surfaces of the buildings will be a combination of brickwork and pressed metal cladding.

The inclusion of these other materials will help to minimise the effect of the glazing, making the buildings more detectable to bats and therefore reduce the potential for collisions to occur.

In addition to façade finishes, the buildings include balconies which will break-up the areas of glazing.

Irish bat species navigate largely by echolocation calls, and fixed structures such as those proposed as part of the proposed development present a low risk in terms of collision. Therefore, the proposed development is considered to not have a significant negative effect on the bat populations at any geographic scale with regard to direct mortality from building collisions.

5.5.3 Potential Cumulative Impacts

Potential cumulative impacts may arise during construction and operation, as a consequence of the Proposed Development acting in-combination with other plans and projects, on water quality in the downstream surface water environment, disturbance to birds, bats and badger, as well as habitat loss to bats, birds and badger.

There are granted planning permissions for residential or other small-scale developments such as extensions to existing dwellings, construction of new car parking spaces, etc. in the immediate vicinity of the Proposed Development site as well as larger scale developments in close proximity to the Proposed Development site, some of which may be in construction at the same time as the Proposed Development. A list of these projects[11] considered in the cumulative impacts assessment has been included in Appendix B of this EIAR.

As demonstrated in Section 5.7 it is considered there are no residual significant ecological effects on designated sites, habitats, badger, bats or breeding birds. Therefore, there is no potential for cumulative effects to arise.

In addition, the potential for in combination effects to arise from any existing or proposed land use plans or developments as regulated and controlled by the environmental protective policies and objectives of the Dún Laoghaire-Rathdown County Development Plan 2022-2028 and the Wicklow County Development Plan 2016-2022. Any existing/proposed plan or project that could potentially act in combination with the Proposed Development, must adhere to these overarching environmental protective policies and objectives (including policies GIB18, GIB19, GIB20, GIB21, GIB22, GIB23, GIB24, GIB25 and GIB28). These policies and objectives will ensure the protection of local biodiversity within the zone of influence of the Proposed Development. These policies and objectives also include the requirement for any future plans or projects to undergo Screening for Appropriate Assessment and/or Appropriate Assessment to examine and assess their effects on European sites, alone and in combination with other plans and projects.

Proposed Schemes which have not yet been submitted to the Planning Authority must comply with all applicable planning and environmental approval requirements and be in accordance with the objectives and policies of the relevant development plan and its policies and objectives, which would ensure the protection of the natural environment.

[11] Obtained from myplan.ie. Accessed May 2022.

In light of the above no cumulative effects are predicted with regard biodiversity, in conjunction with the Proposed Development.

5.6 Avoidance, Remedial & Mitigation Measures

Mitigation measures are discussed only for KERs where a potential significant effect has been identified.

All measures described below will be implemented in full and included in the CEMP to accompany the planning submission. The CEMP is a live document that will be updated by the appointed contractor.

5.6.1 Construction Phase

5.6.1.1 Designated sites

As set out in sections 5.5.1.1.1 and section 5.5.1.1.2 above (as well as within the separate Appropriate Assessment Screening Report accompanying this application with regard European sites (Scott Cawley Ltd 2022)), in concluding that the Proposed Development is not likely to have a significant effect on any European or Nationally designated sites, mitigation measures intended to avoid or reduce any harmful effects of the Proposed Development on designated sites did not form part of the assessment and were not taken into account.

5.6.1.2 Habitats

Any vegetation (including trees or hedgerows adjacent to, or within, the Proposed Development boundary) which is to be retained will be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b), as follows:

- All trees along the Proposed Development boundary that are to be retained, both within and adjacent to the Proposed Development boundary (where the root protection area of the tree extends into the Proposed Development boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees as per the requirements of the British Standard Institution (BSI) British Standard (BS) 5837:2012 Trees in relation to in relation to design, demolition and construction – Recommendation . Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist;
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines

- A qualified arborist will assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the Proposed Development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist
- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged

5.6.1.3 Badger

As the usage of the Proposed Development site by badgers can change over time, a confirmatory pre-construction check of the Proposed Development site for new burrow entrances will be carried out immediately prior to construction works commencing to confirm their usage by badger.

Any new badger setts present will be afforded protection in line with the requirements set out in the NRA (2005) guidance document as follows:

1. Badger setts if encountered will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage
2. In the season June to November, no heavy machinery will be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances
3. During the breeding season (December to June inclusive), none of the above works will be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts
4. Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of an ecologist with experience of badger mitigation.

5.6.1.4 Breeding Birds

Vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st of March and the 31st of August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within three days of the nest survey. Where the vegetation is not cleared within three days of checks, a repeat check will be required. Should nesting birds be encountered during surveys, the removal of vegetation will be required to be delayed until after the nesting has finished.

5.6.1.5 Bats

- Although no evidence of bats was recorded in the buildings or PRF trees located within the Proposed Development site, precautionary mitigation has been proposed in the event that any bats are found to be roosting within the aforementioned structures, during demolition or clearance works, as the usage of the Proposed Development site by bats can change over time. A suitably qualified bat ecologist, licenced as necessary, will undertake a confirmatory preconstruction survey to assess for any changes since

the planning surveys. Thereafter they will be on site during the demolition works of the building, and that if bats are encountered during any works at the site the relevant activity will be suspended until appropriate measures are enacted. A derogation licence may need to be sought from NPWS in order to permit removal of bats and mitigate for the loss of any roosts on the site. This may include measures as outlined in NRA guidance 2006c.

- Lighting proposals for the construction phase will adhere to the advice provided in Bats and Lighting – Guidance for Planners, Engineers, Architects and Developers (Bat Conservation Ireland 2010), Bats and artificial lighting in the UK Bats and the Built Environment series Guidance Note 08/18 (Institution of Lighting Professionals & Bat Conservation Trust, 2018) and Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2011). Construction stage lighting details will be reviewed by a qualified bat ecologist. If necessary, the bat ecologist will recommend adjustments to directional lighting (e.g. through cowls, shields or louvres) to restrict light spill in sensitive areas.

5.6.2 Operational Phase

5.6.2.1 Designated sites

As set out in sections 5.5.2.1.1 and section 5.5.2.1.2 above (as well as within the separate Appropriate Assessment Screening Report accompanying this application with regard European sites (Scott Cawley Ltd. 2022)), in concluding that the Proposed Development is not likely to have a significant effect on any European or Nationally designated sites, mitigation measures intended to avoid or reduce any harmful effects of the Proposed Development on designated sites were not required or taken into account.

5.6.2.2 Habitats

Mitigation measures are not required as no operational phase impacts are predicted on habitats as a result of the Proposed Development.

5.6.2.3 Badger

Mitigation measures are not required as no operational phase impacts are predicted on badgers as a result of the Proposed Development.

5.6.2.4 Breeding Birds

As an enhancement measure for the loss of nesting habitat and in order to provide additional nesting opportunities for breeding birds, 6 no. 1B Schwegler nest boxes[12] or similar will be installed within the Proposed Development site. The nest boxes will be installed at a minimum of 3m above ground level to ensure against disturbance from humans and domestic animals such as cats. The boxes will be deployed across the site in appropriate locations, as advised by a suitably qualified ecologist.

[12] Bird and bat boxes are available to purchase online from NHBS www.nhbs.com and similar websites

5.6.2.5 Bats

Although no bat roosts were confirmed during the surveys, additional roosting opportunities for bats are being proposed to include 6 no. Schwegler 2F bat boxes[11] to be erected on suitable retained trees in suitable locations across the site, the location of which to be decided by a suitably qualified and experienced bat ecologist. This has been recommended as an enhancement measure for the site rather than a mitigation measure as no confirmed roosting site have been identified.

5.6.3 "Worst Case" Scenario

The assessments carried out under sections 5.5.1 and 5.5.2 above are undertaken based on the design received and in the absence of mitigation. Therefore, this assessment represents the worst-case scenario of the Proposed Development prior to the inclusion of mitigation measures. In a general worst-case scenario for the Proposed Development site, all vegetation would be removed, and fauna would cease to use the lands over the long-term.

5.6.4 "Do Nothing" Impact

Under the do-nothing scenario, it is expected that management of the Proposed Development site would remain unchanged and that the existing woodlands, treelines, grasslands and scrub would continue to grow and develop. Characteristics of the site would, therefore, not change drastically other than through natural processes or landowner management, and it would likely continue to support similar fauna.

5.7 Residual Impacts

5.7.1 Residual Effects for Designated Sites

5.7.1.1 Residual Effects for European Sites

Following an examination, analysis and evaluation of the best available information, and applying the precautionary principle, it can be concluded that the possibility of any significant effects on any European sites, whether arising from the project alone or in combination with other plans and projects, can be excluded, for the reasons set outlined in sections 5.5.1.1.1 and 5.5.2.1.1 of this chapter , and in an Appropriate Assessment Screening report (Scott Cawley Ltd 2022) accompanying this application. In reaching this conclusion, the nature of the project and its potential relationship with all European sites within the Zone of Influence, and their conservation objectives, have been fully considered. Therefore, the Proposed Development is not likely to have significant residual effects on any European designated sites.

5.7.1.2 Residual Effects for Nationally designated sites

The assessment presented in sections 5.5.1.1.2 and 5.5.2.1.2, concluded that there was no risk of the Proposed Development resulting in a likely significant effect on any nationally designated sites, either alone or in combination with other plans or projects. Therefore, the Proposed Development is not likely to have significant residual effects on any nationally designated sites.

5.7.2 Residual Effects for Habitats

With regard to the KER habitats identified within the Proposed Development area, there will permanent loss of dry meadows and grassy verges habitat as well as a loss of sections of treeline habitat. However, the proposed retention of broadleaf woodland and the majority of treelines, the extensive landscaping design (including a mixture of semi-mature and multi-stemmed trees) and the mitigation strategy to protect trees to be retained, will minimise the impact of those effects on habitats over the medium to long--term. Although there will be a temporary impact during the construction phase until the proposed planting becomes established, the Proposed Development is not likely to result in long-term effects on habitats and will not result in a likely significant negative residual effect, at any geographic scale.

5.7.3 Residual Effects for Badger

The potential effects of the Proposed Development are considered in Section 5.5.1.4 and 5.5.2.4. Significant effects are not predicted with regards to badgers, and therefore residual effects for badgers are not deemed significant.

5.7.4 Residual Effects for Breeding Birds

The potential effect of the Proposed Development on breeding birds is documented in sections 5.5.1.6 and 5.5.2.6. However, assuming the full and successful implementation of the mitigation measures, no long-term significant impacts are predicted on breeding birds at any geographical scale.

5.7.5 Residual Effects for Bats

The potential effect of the Proposed Development on bats is documented in sections 5.5.1.7 and 5.5.2.7. However, assuming the full and successful implementation of the mitigation measures outlined within this Chapter, no residual impacts are predicted on bats.

5.8 Monitoring

5.8.1 Construction Phase

A suitably experienced and qualified Ecological Clerk of Works (ECoW) will be retained by the appointed contractor. The ECoW will advise the appointed contractor on ecological matters during construction, undertake preconstruction surveys as necessary, communicate all findings in a timely manner to the appointed contractor and statutory authorities, acquire any licenses / consents required to conduct the work, and supervise and direct the ecological measures associated with the Proposed Scheme.

Pre-construction surveys for PRFs (5.6.1.5), breeding birds (5.6.1.4) and badger (5.6.1.3) will be carried out as described in the respective sections above.

5.8.2 Operational Phase

It is recommended that post installation monitoring of the bird and bat boxes (outlined in sections 5.6.2.4 and 5.6.2.5 respectively) is carried out to determine the efficacy of this measure.

These checks will be undertaken in years 1, 3 and 5 post construction with a memo provided to the client following each check.

5.9 Interactions

Biodiversity interacts with several environmental factors including land and soils, hydrology, air quality, climate and microclimate and, noise and vibrations Chapters of the EIAR. Changes to these environmental factors could result in significant impacts on biodiversity such as the following:

5.9.1 Land & soils

Interactions between soils & land and biodiversity can occur through the spread of any hazardous material/contaminated land which may occur during the construction stage. The spread of land contaminated with potentially hazardous material could result in habitat degradation of habitats within the Proposed Development site and adjacent/downstream designated sites and their associated qualifying interests. Following the implementation measures outlined within the Outline Construction Management Plan (OCMP), impacts to habitats, flora and fauna from soils and land interactions are not predicted to be significant.

5.9.2 Hydrology

Interactions between hydrology and biodiversity including habitats, flora and fauna can occur through impacts to water quality either arising from an accidental pollution event or increased sedimentation during the construction stage or an accidental pollution event during the operational stage. This interaction has the potential to result in significant impacts on hydrologically connected habitats and sensitive fauna that rely on these habitats. However, for reasons outlined in the relevant sections above (i.e., 5.5.1.1 and 5.5.2.1) impacts to downstream sensitive habitats and fauna are not predicted to be significant.

5.9.3 Air Quality, Climate and Microclimate

Interactions between air quality and flora and fauna in adjacent habitats and designated sites can occur during the construction stage due to dust emissions arising from construction works. This interaction has the potential to result in significant impacts on biodiversity. However, once the dust minimisation measures outlined in the OCMP accompanying this report are implemented, impacts to flora and fauna are not predicted to be significant.

5.9.4 Noise & vibrations

Interactions between noise and sensitive fauna, namely birds, bats and badgers can occur and arise from increased noise levels during the construction stage. This interaction has the potential to result in significant impacts and has been assessed when considering disturbance impacts during construction. However, for reasons outlined in the relevant sections above (i.e. 5.5.1.6, 5.5.1.7 and 5.5.1.4) impacts to fauna from noise interactions are not predicted to be significant.

5.10 Difficulties Encountered When Compiling

With regards to terrestrial mammals such as badger, surveys were conducted during the sub-optimal season (June - August inclusive), based on Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, undated). This is considered the sub-optimal season as many signs of mammals, including setts can be obscured by increased vegetation cover. However, this was not considered to be a limitation of the assessment as it was possible to access all areas of the Proposed Development site. Additionally, an updated mammal survey was undertaken by Scott Cawley Ltd. Ecologists in May 2022, which falls within the optimum survey season for terrestrial mammals. Therefore, this limitation is not considered to have compromised the baseline prediction or the impact assessment.

Wintering bird surveys were initially undertaken on 19th February, 2nd March and 19th March 2021. These surveys did not represent a full survey season and as per the Advice Note on the lifespan of ecological reports & surveys (CIEEM , 2019) any surveys relating to mobile species, undertaken more than 12 months ago are deemed invalid. However, this has not impacted on the findings of this assessment as updated wintering bird surveys were undertaken within the Proposed Development site on 23rd November 2021, 20th December 2021, 19th January 2022, 2nd February 2022 and 22nd March 2022. These surveys provide an up-to-date assessment carried out over the full wintering bird season.

All other surveys including habitat, breeding bird and bat activity surveys were conducted during the optimal survey seasons and thus there is no limitation in this regard.

5.11 References

Atherton, I., Bosanquet, S. & Lawley, M. (eds.) (2010) Mosses and liverworts of Britain and Ireland. A field guide. Plymouth, British Bryological Society.

Banks, R.C (1979). *Human related mortality of birds in the United States*. U.S. Fish Wildl. Serv. Spec. Sci. Rep. Wildl. 215. 16 pp.

Bing G.-C., Choi C.-Y., Nam H.-Y., Park J.-G., Hong G.-P., Sung J.-K., Chae H.-Y & Choi Y.-B. (2012). *Causes of mortality in birds at stopover islands.* Korean J. Ornithol., 19, 23–31.

CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal, and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2019) *On the lifespan of Ecological Reports & Surveys.* Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).* The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

Department of Culture Heritage and the Gaeltacht (2017) *National Biodiversity Action Plan* 2017-2021

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

Dún Laoghaire-Rathdown County Council (2013) *Dún Laoghaire-Rathdown Biodiversity Plan 2009-2013*. Dún Laoghaire-Rathdown County Council. Available at: https://www.dlrcoco.ie/sites/default/files/atoms/files/biodiversity_plan.pdf

Dún Laoghaire-Rathdown County Council (2022) *Dún Laoghaire-Rathdown County Development Plan 2022-2028.* Dún Laoghaire-Rathdown County Council.

Enviroguide Consulting (2022) Draft Hydrological and hydrogeological risk assessment report for strategic housing development at wayside, Enniskerry road, Kilternan, Dublin 18

Environmental Protection Agency (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports. Available at: https://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf

Erickson, W.P., Johnson, G.D. and Young, P.D. (2005). *A Summary and Comparison of Bird Mortality from Anthropogenic Causes with an Emphasis on Collisions.* USDA Forest Service Gen. Tech. Rep. PSW-GTR-191. 2005.

Erickson, W. P., G. D. Johnson, M. D. Strickland, D. P. Young, Jr., K. J. Sernka, and R. E. Good. (2001). *Avian collisions with wind turbines: A summary of existing studies and comparisons to other sources of avian collision mortality in the United States.* National Wind Coordinating Committee, c/o RESOLVE, Inc., Washington, D.C.

European Commission (2013) *Interpretation Manual of European Union Habitats*. EUR 28 April 2013. Available online from the European Commission website at: https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf

Fossitt, J.A. (2000) *A Guide to Habitats in Ireland.* Heritage Council.

Furness, R.W. (2019) *Avoidance rates of herring gull, great black-backed gull and common gull for use in the assessment of terrestrial wind farms in Scotland.* Scottish Natural Heritage Research Report No. 1019.

Gilbert, G., Stanbury, A. and Lewis L. (2021) *Birds of Conservation Concern in Ireland 4*: 2020 – 2026. Irish Birds 43: 1–22

Gilbert, G., Gibbons, D.W. and Evans, J. (1998) Bird Monitoring Methods. The Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire, England. ISBN-978-1-907807-22-0

Greif, S., Zsebők, S., Schmieder, D. & Siemers, B.M. (2017). *Acoustic mirrors as sensory traps for bats.* Science, 357(6355), 1045-1047.

Irish Water (2020) Shanganagh D0038-02 Annual Environmental Report 2020.

Jenkins, A., Smallie, J.J. and Diamond, M. (2010). *Avian collisions with power lines: A global review of causes and mitigation with a South African perspective.* Bird Conservation International, 20(03), 263 – 278.

Klem, D. (1990). *Collisions between birds and windows: mortality and prevention.* Journal of Field Ornithology, 61, 120–128.

Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals, No. 25*. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Longcore, T. Rich, C., Mineau, P., MacDonald, B., Bert, D.G., Sullivan, L.M., Mutrie, E., et al. (2013). *Avian mortality at communication towers in the United States and Canada: which species, how many, and where?* Biological Conservation, 158, 410-419.

Macklin, R. & Brazier, B. (2019) *Otter survey of selected rivers in Dún Laoghaire-Rathdown County Council district with management recommendations*. Prepared by Triturus Environmental Ltd. for Dún Laoghaire-Rathdown County Council

Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

NRA (2005) Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes

National Roads Authority (2006a) *Best Practice Guidelines for the Conservation of Bats in the Planning of National Roads Schemes.* National Roads Authority (Now part of Transport Infrastructure Ireland), Dublin.

National Roads Authority (2006b) Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes. National Roads Authority (Now part of Transport Infrastructure Ireland), Dublin.

NRA (2006c) Guidelines for the Treatment of Otter Prior to the Construction of National Road Schemes

National Roads Authority (2009) Guidel*ines for Assessment of Ecological Impacts of National Roads Schemes.* National Roads Authority (Now part of Transport Infrastructure Ireland), Dublin.

NRA (undated) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes

NPWS (2009) *Site Synopsis – Loughlinstown Wood (001211)*.

NPWS (2009) *Site Synopsis – Dalkey Coastal Zone and Killiney Hill (001206)*.

NPWS (2019a). *The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments.* Unpublished NPWS Report. Edited by: Deirdre Lynn and Fionnuala O'Neill. National Parks & Wildlife Services. Department of Culture, Heritage and the Gaeltacht.

NPWS (2019b). *The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments.* Unpublished NPWS Report. Edited by: Deirdre Lynn and Fionnuala O'Neill. National Parks & Wildlife Services. Department of Culture, Heritage and the Gaeltacht.

Rich, C. and Longcore, T. (2005) *Ecological Consequences of Artificial Night Lighting.* Island Press. ISBN-9781559631297

Roche N., Aughney T., Marnell, F. & Lundy, M. (2014) Irish bats in the 21st Century. Bat Conservation Ireland, Virginia, Co. Cavan.

Russ, J. (2012) *British Bat Calls: A Guide to Species Identification.* Pelagic Publishing, Exeter.

Smith, F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping.* The Heritage Council: Kilkenny

Scottish Natural Heritage (SNH) (2018) *Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model.* September 2018 v2.

Sheppard, C. & Phillips, G. (2015). *Bird-Friendly Building Design, 2nd Ed.* The Plains, VA: American Bird Conservancy, 2015.

Stace (2019) *New Flora of the British Isles. 4th* Edition. Cambridge University Press, Cambridge.

Scott Cawley Ltd. (2022) *Appropriate Assessment Screening Report. Proposed Residential Development. Glenamuck South, Kilternan, Co. Dublin*

Timm, R.M. (1989). *Migration and molt patterns of red bats, Lasiurus borealis (Chiroptera: Vespertilionidae).* Illinois Bulletin Chicago Academic Science, 14,1–7.

Weekes, L.C. & FitzPatrick, Ú. (2010) The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

6 LAND, SOIL AND GEOLOGY

6.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the land, soils and geology within and immediately surrounding the Proposed Development site, an assessment of the potential impacts of the Proposed Development on land, soils and geology and sets out any required mitigation measures where appropriate.

The principal objectives of this Chapter are to identify:

- Land, soils, and geological characteristics at the Proposed Development site;
- Potential impacts that the Proposed Development may have on land, soils and geology including “worst case” scenario assessment;
- Potential constraints that the environmental attributes may place on the Proposed Development;
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

This Chapter of the EIAR was written by Gareth Carroll BAI, Senior Environmental Consultant with Enviroguide Consulting with over 9 years’ experience of environmental assessment of brownfield and greenfield sites. The Chapter was reviewed by Claire Clifford BSc., MSc., PGeo., EurGeol who is Technical Director of the Contaminated Land and Hydrogeology Division of Enviroguide Consulting and is a Professional Geologist with the Institute of Geologists of Ireland and has extensive experience in preparing environmental assessments for a range of project types and geological and hydrogeological site settings.

6.1.1 Description of the Proposed Development

The Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as ‘Rockville’ and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

The Proposed Development site layout is presented in Figure 6-1.

Figure 6-1. Proposed Development Site Layout

6.2 Study Methodology

6.2.1 Regulation and Guidance

The methodology adopted for the assessment takes cognisance of the relevant guidelines in particular the following:

- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide (IGI, 2002);
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009); and
- OPR, June 2021. OPR Practice Note PN02. Environmental Impact Assessment Screening (OPR, 2021).

6.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An Initial Assessment and Impact Determination stage was carried out by Enviroguide Consulting to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of land, soil, geological environment, to establish the activities associated with the Proposed Development and to undertake an initial assessment and impact determination.

This stage of the assessment included a desk top study that comprised a review of published environmental information for the Proposed Development site and information provided by the Applicant. The study area, for the purposes of assessing the baseline conditions for the Land, Soil and Geology Chapter of the EIAR, extends beyond the Proposed Development site boundaries and includes potential receptors within a 2.0km radius of the Proposed Development site (IGI, 2013).

This stage of the assessment was completed by Enviroguide Consulting and included the review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping (EPA, 2022);
- Environmental Protection Agency (EPA) Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities (EPA, 2020);
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater webmapping (GSI, 2022);
- Ordnance Survey Ireland (OSI) webmapping (OSI, 2022);
- National Parks and Wildlife Services (NPWS) webmapping (NPWS, 2022);
- Teagasc webmapping (Teagasc, 2022); and
- Information provided by the Applicant pertaining to previous site investigations and the design proposals for the Proposed Development.

Element 2: Based on a review of the information compiled and assessed in Element 1 including site investigation data, it was determined that a direct or indirect site investigations and studies stage was not required as there was sufficient baseline information available regarding the Proposed Development site to inform the impact assessment of the Proposed Development on the receiving land, soil, and geology environment.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the Construction Phase and the Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Land, Soils and Geology Chapter of the EIAR which includes all the associated figures and documents.

6.2.3 Description of Importance of the Receiving Environment

The National Roads Authority (NRA) criteria for estimation of the importance of geological features at the Proposed Development site during the Environmental Impact Assessment (EIA) stage, as documented by IGI (IGI, 2013) are summarised in Table 6-1.

Table 6-1: Criteria for Rating Site Importance of Geological Features

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource.
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on-site with previous heavy industrial usage. Large recent landfill site for mixed wastes. Geological feature of high value on a local scale (County Geological Site). Well drained and/or high fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying route is moderate on a local scale.	Contaminated soil on-site with previous light industrial usage. Small recent landfill site for mixed wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

6.2.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter is described in

Table *6-2*.

Table 6-2: Assessment of Potential Impacts Terminology and Methodology

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.
Significance of Effects / Impacts	**Definition**
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 a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects / Impacts	**Definition**
Momentary	Effects lasting from seconds to minutes.
Brief	Effects lasting less than a day.
Temporary	Effects lasting one year or less.
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects that can be undone, for example through remediation or restoration.

6.3 The Existing and Receiving Environment (Baseline Situation)

6.3.1 Site Location and Description

The Proposed Development site is located at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18 and approximately 1.9 km southwest of the M50 and Carrickmines Retail Park. The Proposed Development site location is presented in Figure 6-2.

The Proposed Development site is 11.153Ha which includes the developable site area of 10.8Ha and drainage / service works outside of the ownership boundary.

The Proposed Development site is accessed from the Enniskerry Road (R117) and currently comprises undeveloped lands and agricultural lands (grazing of cattle) with a derelict dwelling known as ‘Rockville’ and associated derelict outbuilding.

The lands across the majority of the Proposed Development site are zoned ‘Objective A – to provide residential development and/or protect and improve residential amenity. While the

lands along the western boundary of the Proposed Development site are zoned 'Objective NC – to protect, provide for and/or improve mixed-use neighbourhood centre facilities' under the Dún Laoghaire-Rathdown County Development Plan 2022-2028 (Dún Laoghaire-Rathdown County, April 2022).

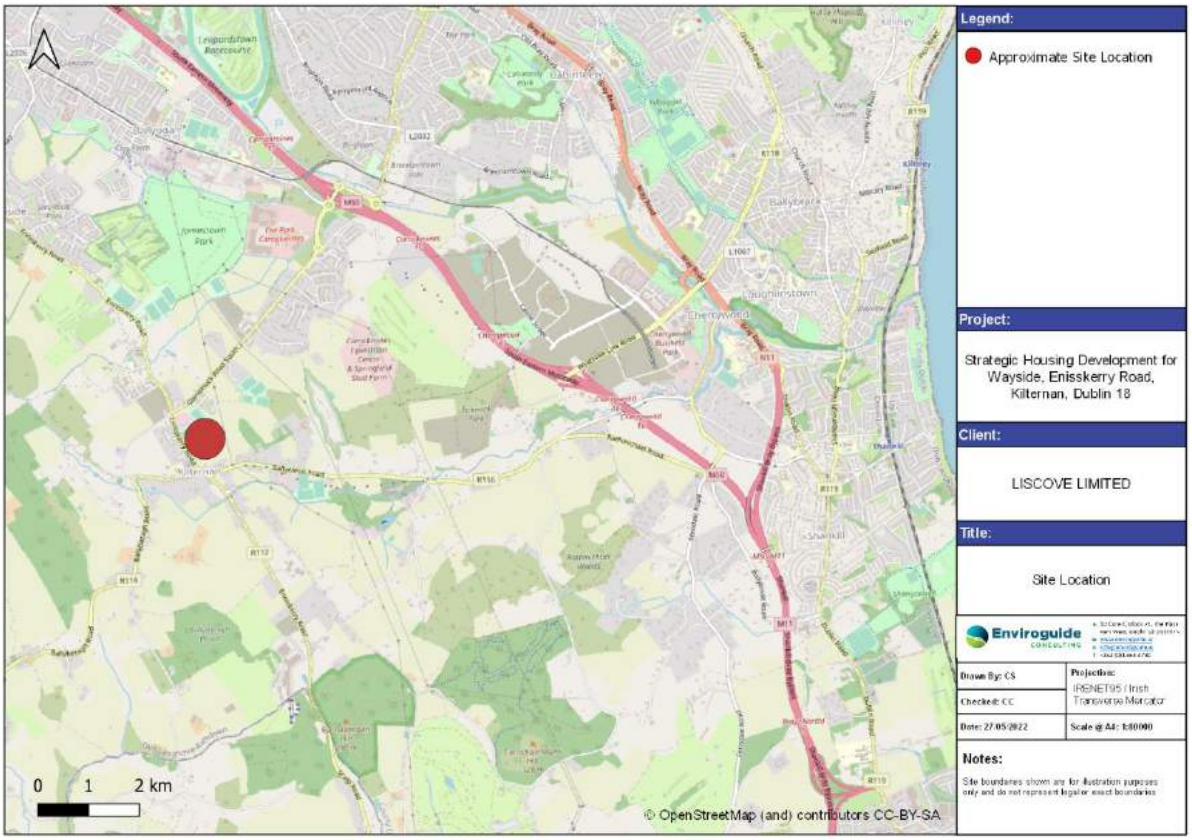

Figure 6-2: Site Location

6.3.2 Historical Land Use

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2022) and Google Earth (Google Earth, 2022) were reviewed and key observations on-site and off-site are summarised in

Table *6-3*.

Table 6-3: Onsite and Offsite Historical Land Use

Date	Information Source	Site Description
1837-1842	**OSI map 6inch**	**On-site:** The Proposed Development site is shown as open fields separated by field boundaries and hedgerows. There is a buildings/structures and associated outbuildings identified in the southern corner of the Proposed Development site. **Off-site:** The surrounding lands are predominantly open fields divided by field boundaries with a number of one-off buildings/structures. There are two (2No.) historic quarries and four (4No.) historic gravel pits identified within a 2km radius of the Proposed Development site.
1888-1913	**OSI map 25inch**	**On-site:** There are some additional buildings/structures identified in the southern corner of the Proposed Development site. **Off-site:** There are a number of additional building structures identified in the lands to west / northwest of the Proposed Development site. The previously noted historic quarries are no longer identified and there are only three (3No.) historic gravel pits identified within 2km of the Proposed Development site.
1830-1930	**OSI Cassini map 6inch**	**On-site:** No significant changes. **Off-site:** No significant changes.
1995	**OSI Aerial photography**	**On-site:** There are a number of sports pitches located in the central and northern portion of the Proposed Development Site. Overhead powerlines are identified in the eastern corner of the Proposed Development Site. **Off-site:** The lands to the north, west and south have been significantly developed however the lands adjoining the east of the Proposed Development Site remain undeveloped.
2000	**OSI Aerial photography**	**On-site:** No significant changes **Off-site:** No significant changes.
2005	**OSI Aerial photography**	**On-site:** No significant changes **Off-site:** No significant changes.
2005-2012	**OSI Aerial Photography**	**On-site:** No significant changes **Off-site:** No significant changes.
2011-2013	**OSI Aerial Photography**	**On-site:** No significant changes **Off-site:** No significant changes.
2013-2018	**OSI Aerial Photography**	**On-site:** No significant changes **Off-site:** No significant changes.
2021	**Google Maps Photography**	**On-site:** The previously identified sports pitches are no longer present. **Off-site:** No significant changes

6.3.3 Surrounding Land Use

The Proposed Development site is located within Kilternan Village with the surrounding land use comprising predominantly residential housing and agricultural lands.

The Proposed Development site is bounded by Glenamuck Road, Kilternan Country Market and the Sancta Maria property to the north and northwest, by Enniskerry Road to the west and southwest, by residential dwellings to the south and southeast and by agricultural lands and the Rockville residential development to the east and northeast.

6.3.4 Topography

The topography surrounding the Proposed Development site is generally toward the east and northeast towards the coast.

As documented in the Engineering Infrastructure Report (Roger Mullarkey & Associates, 2022), the topography at the Proposed Development site is generally a gradually increasing slope downwards from Enniskerry Road (western boundary) in a north-easterly direction and then falls off sharply toward the eastern boundary of the Proposed Development site at a gradient of approximately 10%. Ground elevations at the site range from approximately 143.07mOD in the southwest to 132.85mOD in the northeast of the Proposed Development site (Roger Mullarkey & Associates, 2022).

6.3.5 Soils

The soils beneath the majority of the Proposed Development Site have been mapped by Teagasc (Teagasc, 2022) as imperfectly drained peat over lithoskelatal acid igneous rock of the Carrigvanagh (0410a) soil series. While the soils beneath a section of the northern portion and the southeast corner of the Proposed Development site are mapped by Teagasc (Teagasc, 2022) as 'Urban'. The Teagasc (Teagasc, 2022) mapped soils at the Proposed Development site are presented in Figure 6-3.

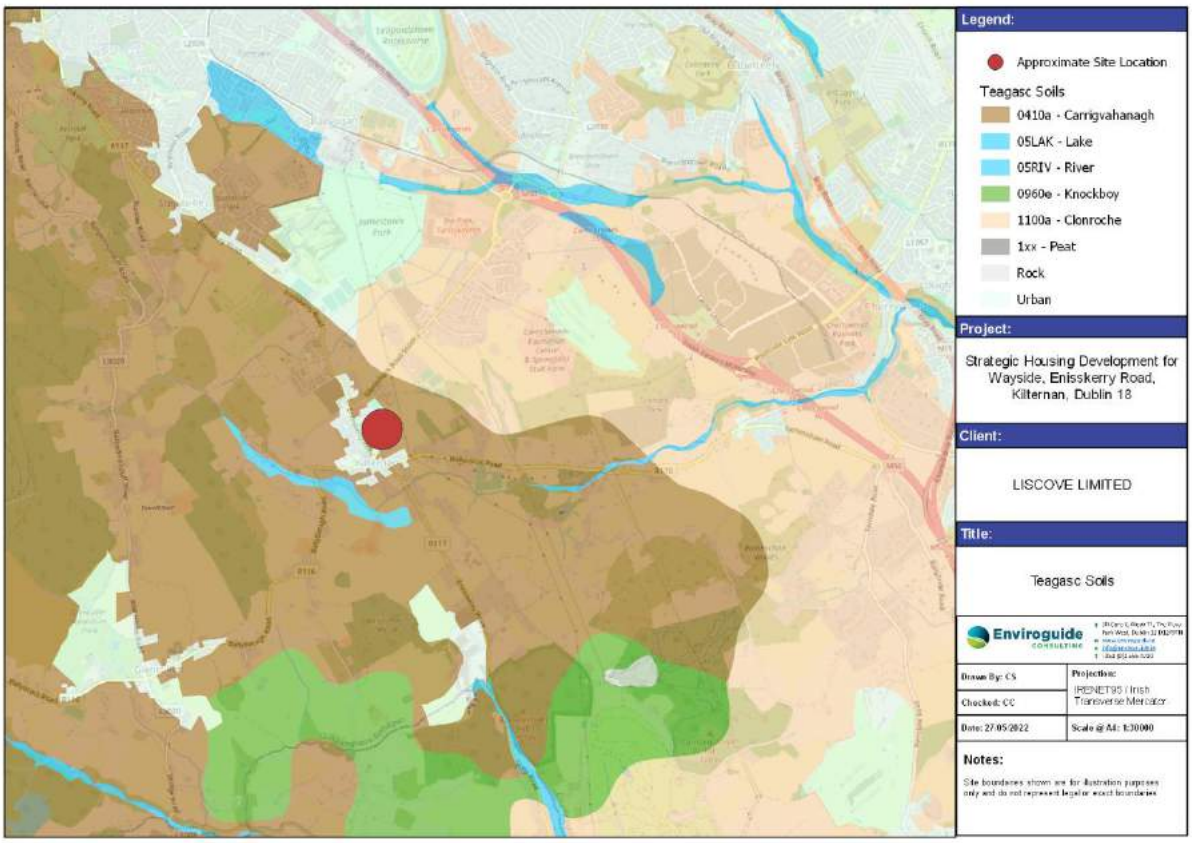

Figure 6-3: Soils

6.3.6 Quaternary Soils

The subsoils or quaternary soils beneath the majority Proposed Development site are mapped by the GSI (GSI, 2022) as 'till derived from granites (TGr)', while the subsoils mapped beneath the northern and southern portions of the Proposed Development site are mapped by the GSI (GSI, 2022) as 'bedrock outcrop or subcrop (Rck)'. The quaternary geology at the Proposed Development site is presented Figure 6-4.

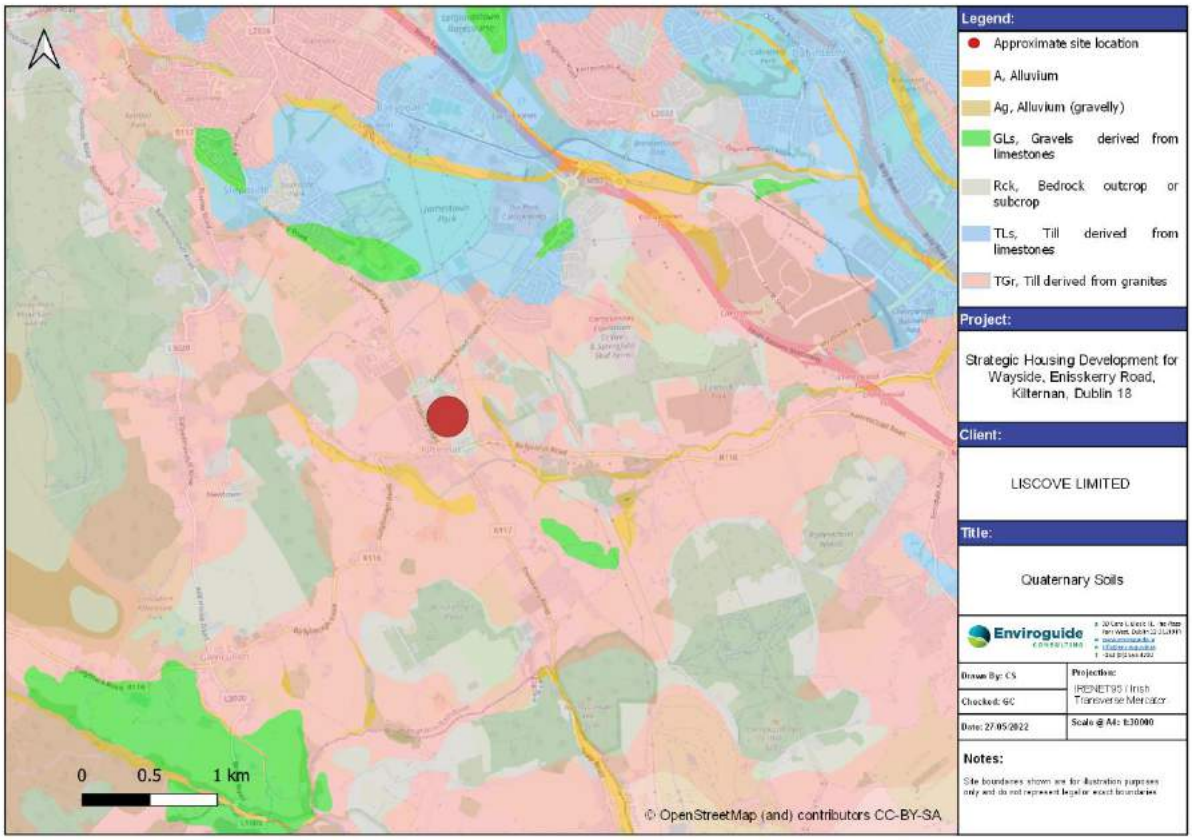

Figure 6-4: Quaternary Soils

6.3.7 Quaternary Geomorphology

Two undifferentiated meltwater channels are identified approximately 0.01km and 0.62km east of the eastern boundary of the Proposed Development site. The meltwater channels is orientated in a southeast direction (GSI, 2022).

There is also a deglacial hummocky sand and gravel landform identified 0.92km southeast of the Proposed Development site (GSI, 2022).

6.3.8 Bedrock Geology

Based on the GSI database (GSI, 2022) the bedrock beneath the Proposed Development site is mapped as the Type 3 Muscovite Porphyritic Formation (Stratigraphic Code: Nt3; New Code IDNLGR3) which is comprised of granite with muscovite phenocrysts.

There are a number of outcrops mapped within a 2km radius of the site boundary the closest of which is located 0.25km southeast of the Proposed Development site.

The bedrock geology is presented in Figure 6-5.

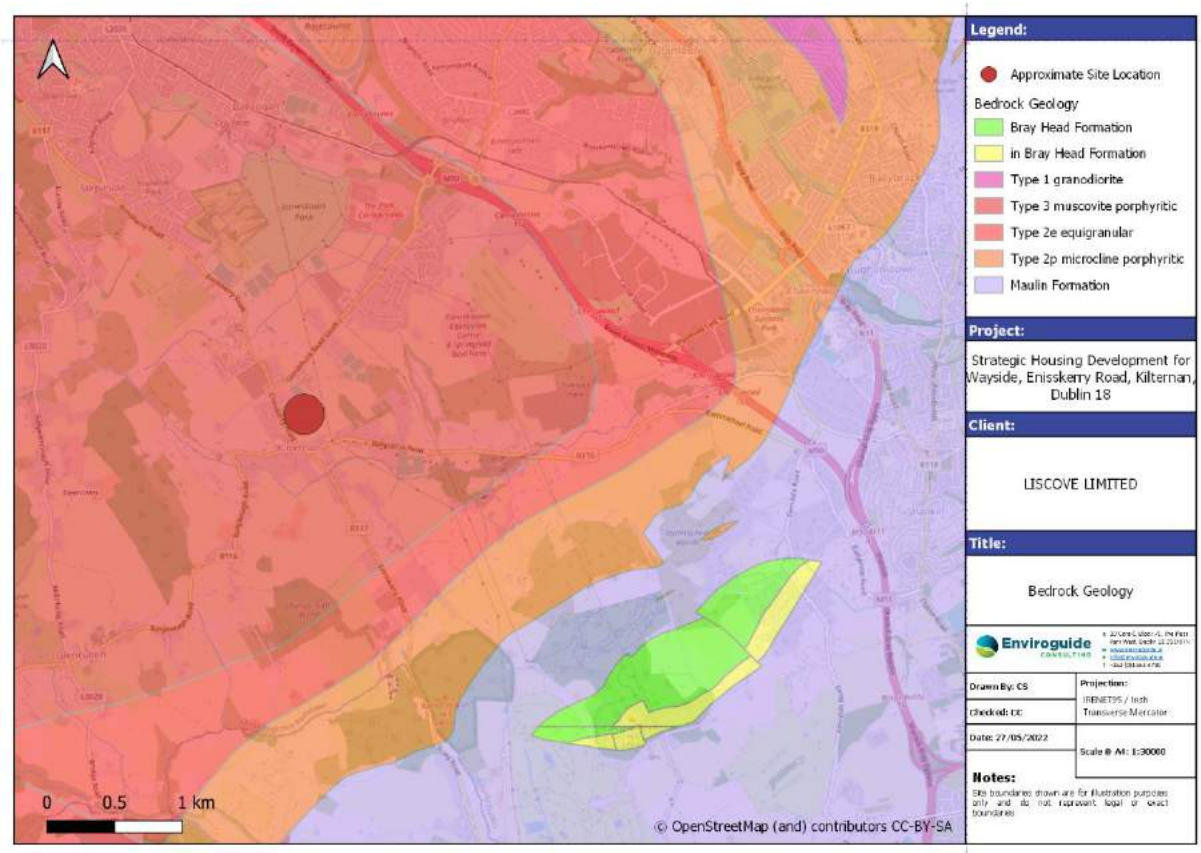

Figure 6-5: Bedrock Geology

6.3.9 Site Investigation Results

Previous site investigations were carried out at the Proposed Development site which included trial pit excavations for soakaway design as detailed in the following reports:

- Site Investigations Ltd., 2006. Ground Investigation Report (SII, 2006);
- Ground Investigations Ireland Ltd., 2010. Report on Soil Infiltration Tests for Soakaway Design at Kilternan Village Site, Co. Dublin (GII, 2010); and
- Ground Investigations Ireland Ltd., 2017. Kilternan Village Ground Investigation Report (GII, 2017).
- Apex Geoservices Ltd. 2008, Report of the Geophysical Survey for the Proposed Development at Kilternan Village, Co. Wicklow.

The soil and bedrock strata recorded in these reports, which are included in the Infrastructure Design Report (Roger Mullarkey & Associates, 2022) submitted as part of the planning application, is summarised as follows:

- Topsoil to a depth of 0.3 meters below ground level (mbGL);
- Brown, slightly gravelly, sandy CLAY to a depth of 0.9mbGL;

- Light brown, slightly sandy, gravelly CLAY / SILT to 2.9mbGL; and
- Weathered GRANITE encountered between 0.8mbGL and 2.9mbGL.

The geophysical data (Apex Geoservices Ltd., 2008) identifies the following three layers within the granite bedrock

- An upper layer of completely to highly weathered granite that has an average thickness of 1.6mbGL across the Proposed Development site;
- An underlying layer of highly to moderately weathered granite with an average thickness of 2.5mbGL across the Proposed Development site;
- An underlying slightly weathered to fresh granite bedrock at depths ranging from 2mbGL to 6.9mbGL.

Groundwater strikes were recorded during drilling of boreholes at the Proposed Development Site (SII, 2006; borehole logs are appended to the Roger Mullarkey & Associates, 2022 Engineering Infrastructure and Stormwater Impact Assessment Report however a location map for boreholes is not included. See Appendix E of this EIAR). Groundwater is assessed in Chapter 7 of this EIAR.

6.3.10 Radon

The Proposed Development site is mapped by the EPA (EPA, 2022) to be in an area where between 5% and 10% of the homes in a 10km grid square are estimated to be above the national Reference Level of 200 Becquerel per cubic metre (Bq/m3) for long term exposure to radon in a house. A High Radon Area is any area where it is predicted that between 5% and 10% of homes will exceed the national Reference Level. Therefore, the Proposed Development site is considered to be within a High Radon Area. It is noted that a high radon level can be found in any home, in any part of the country, but these homes are more likely to be located in High Radon Areas.

6.3.11 Geological Heritage

A review of the GSI Geological Heritage Database (GSI, 2022) indicates three (3No.) geological heritage sites located within 2km radius of the Proposed Development site including the Ballybetagh Bog (Site Code DLR001), the Scalp (Site Code: DLR010) described as a deep channel formed by meltwater erosion and Carrickgollogan (Site Code: DLR004) described as a small but prominent hill located approximately 1.42km southwest, 1.5km south and 2.0km southeast of the Proposed Development Site respectively.

6.3.12 Economic Geology

The Proposed Development site is mapped by the GSI (GSI, 2021) as having no potential for granular aggregate.

The bedrock beneath the majority of the Proposed Development site has been identified by the GSI (GSI, 2021) as having a ‘high potential’ for crushed rock aggregate.

6.3.13 Geohazards

The GSI (GSI, 2022) records for karst features indicate that there are no karst features within 2km of the Proposed Development site or within the granite bedrock formation beneath the Proposed Development site. It is noted that karstification primarily occurs in limestone bedrock units across Ireland.

The Proposed Development site and surrounding lands are located within an area with a 'Low' landslide susceptibility classification (GSI, 2022). There are no recorded landslides at the Proposed Development Site recorded on the GSI database (GSI, 2022) and the closest, which were associated with a series of rock falls on steep slopes of glacial outflow, are recorded approximately 1.99km south of the Proposed Development Site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network operated by Dublin Institute for Advanced Studies (DIAS) which has been recording seismic events in Ireland since 1978. There are six permanent broadband seismic recording stations in Ireland operated by DIAS. Records since 2010 show that the majority of recorded seismic events were associated with quarry blasts and no recent events have been recorded within 2km of the Proposed Development site or the Greater Dublin Area.

6.3.14 Summary of Baseline

In accordance with the criteria in Table 6-1 the soil and geology underlying the Proposed Development site would be rated as an attribute of 'medium' importance.

The Proposed Development site is primarily greenfield site with derelict dwelling and associated outbuildings located in the southern portion of the site and within an area mapped as having a 'high potential' for crushed rock aggregate high aggregate (GSI, 2022) however, it is considered that the economic extraction of crushed rock aggregate at the Proposed Development site is not be feasible taking account of the site setting.

6.4 Characteristics of the Proposed Development

6.4.1 Construction Phase

The construction of the Proposed Development will take place in six phases (Phase 1, 2, 2A, 3, 4 and 5) starting from the western central portion of the site, moving in an anti-clockwise direction through Phase 2 and Phase 2A to the East and Phase 3 to the North. The southern two sections of the site will be completed next, starting in the south-eastern corner of the site (Phase 4) and moving south westerly to Phase 5. The overall duration of the project is estimated to be 5 years between April 2023 and April 2028.

The land-use at the Proposed Development site will be changed from agricultural lands (grazing of cattle) to a mixed use residential and retail/commercial land use.

There will be a total land landtake of up to 11.2 Ha including the developable site area of 10.8 Ha and drainage / service works outside of the ownership boundary.

All foundations are shallow strip foundations on bedrock with no requirement for piling.

It is estimated by Roger Mullarkey & Associates that the Proposed Development will involve the excavation of 72,500m^3 of soils and bedrock for the construction of foundations, drainage and other infrastructure to depths of 1.0m for foundations and 1.7m to 4.1mbGL for drainage and infrastructure.

It is estimated by Roger Mullarkey & Associates that 31,650m^3 of soils and bedrock excavated during the Construction Phase will be reused on-site to be incorporated into the design of the Proposed Development for engineering fill and landscaping subject to assessment of the suitability for use in accordance with engineering and environmental specifications that will be determined as part of the detailed design. However, the remaining 40,850m^3 of surplus soil and bedrock arising from groundworks will require off-site removal for reuse or recovery in accordance with appropriate statutory consents and approvals.

It is estimated by Roger Mullarkey & Associates that the importation of 35,600m^3 of aggregate fill materials will be required for the construction of the Proposed Development (e.g., granular material beneath road pavement, under floor slabs and for drainage and utility bedding / surrounds etc.).

6.4.2 Operational Phase

The Operational Phase of the Proposed Development consists of the typical activities in a residential area and with the exception localised gardening works by residents, there will be no bulk excavation of soils or bedrock or infilling of waste.

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the Operational Phase as the main operating system for heating will be gas based / air to water heat pump and further details are provided in Chapter 12 of this EIAR.

6.5 Potential Impact of the Proposed Development

The procedure for determination of potential impacts on the receiving land, soils and geology is to identify potential receptors within the Proposed Development site boundary and surrounding environment and use the information gathered during the desk study and site walkover to assess the degree to which these receptors will be impacted upon in the absence of mitigation. Impacts are described in terms of quality, significance, duration and type as detailed in Table 6-2.

6.5.1 Construction Phase

6.5.1.1 Direct

Land Take and Land Use

There will be a total land landtake of up to 11.153Ha for the Construction of the Proposed Development including the developable site area of 10.8Ha and drainage / service works outside of the ownership boundary. The land-use at the Proposed Development site will be agricultural lands (grazing of cattle) to mixed use residential and retail/commercial land use. The Proposed Development is in line with ‘Objective A’ and ‘Objective NC’ zoning objectives under the Dún Laoghaire-Rathdown County Development Plan 2022-2028 (Dún Laoghaire-Rathdown County, April 2022) for the area where the Proposed Development site is located.

Therefore, there will be an unavoidable land take with loss of undeveloped land and soil with a 'negative', 'moderate' and 'permanent' impact taking account of the surrounding land and zoning objectives.

Excavation and Removal of Soil, Subsoil and Bedrock

There will be an unavoidable a loss of in-situ soil, subsoil and bedrock through excavation works to achieve the formation levels for the Proposed Development including the foundations, roadways, parking, drainage infrastructure and landscaping.

The Proposed Development will involve excavation of soils and bedrock to depths of 1.0m for foundations and 1.7m to 4.1mbGL for drainage and infrastructure.

Where possible, it is intended to retain and re-use suitable excavated soil and subsoil at the Proposed Development site for engineering fill and landscaping, however it is anticipated that up to 40,850m^3 of excavated soils and bedrock will require removal from the Proposed Development site.

The soils underlying the Proposed Development site are considered to be of 'medium' importance (refer to Section 6.3.14). Accordingly, there will be 'negative', 'moderate' and 'permanent' impact at the Proposed Development site

The removal of surplus soil offsite will be undertaken in accordance with applicable statutory requirements. This may include where suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011. The potential impact with removal offsite of surplus soil and other material as wastes is assessed in Chapter 12 Material Assets.

Soil Quality and Contamination

The reuse of up to 31,650m^3 of excavated soils and bedrock at the Proposed Development site for engineering fill and landscaping will have a 'neutral', 'imperceptible' and 'permanent' impact given that it will have undergone testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development.

There is a potential risk associated with the use of cementitious materials during construction of the building foundations, infrastructure and other in ground works at the site. It is considered that this may result in a 'negative', 'moderate' and 'long-term' impact on existing quality of soil within a localised areas underlying the Proposed Development site.

The potential accidental release of deleterious materials including fuels and other materials being used on-site, through the failure of secondary containment or a materials' handling accident on the Proposed Development site could potentially result in a 'negative', 'moderate to significant', 'long-term' impact on the receiving geological environment depending on the nature of the incident.

Soil Structure

The excavation and reuse of soils and bedrock at the Proposed Development will result in the exposure of the materials to various elements including weather and construction traffic. Soils

and bedrock pending reuse onsite will be stockpiled in a controlled manner with a potential 'negative', 'slight' and long-term' impact on the natural strength of the materials.

Importation of Fill Material

The Proposed Development will require the importation of 35,600 m^3 of aggregates during the Construction Phase of the Proposed Development for use as granular material beneath road pavements, under floor slabs and for drainage and utility bedding / surrounds.

In the unlikely event that aggregate materials are sourced from unlicensed or unauthorised sources, it may result in the importation of uncertified or material not suitable for use at the Proposed Development site. In the unlikely event of the importation of contaminated materials on-site, there will be a 'negative', 'moderate to significant' and 'long term' impact on the receiving lands, soil and geology at the Proposed Development site.

Contract and procurement procedures will ensure that all aggregates and fill material required for construction are sourced from reputable authorised suppliers operating in a sustainable manner and in accordance with the necessary statutory consents. The potential impacts may include loss of attribute and changes in the hydrogeological/ geological regime at the source or borrow sites. As only authorised sources of aggregates and other building materials will be used, it is anticipated that the importation aggregates identified for use on-site will have a 'neutral', 'imperceptible' and 'long term' impact on the source site taking account of the fact that the statutory consent process would have required the necessary environmental impacts to be assessed and mitigated as appropriate.

Geological Hazards

Earthquakes are not likely to occur in the vicinity of the Proposed Development site at a sufficient intensity to pose a risk for the Proposed Development. The GSI database indicates that the Proposed Development site is located within an area of low susceptibility to landslides. Furthermore, therefore, there are no potential ground stability hazards identified for the Proposed Development site.

The site is not located within an area associated with karst geology due to the nature of the underlying granite bedrock and therefore there are no identified risks associated with karst features.

The previous site investigation reports (SII, 2006, GII, 210 and GII, 2017) did not reference any issues associated with pyrite. All aggregates imported to the site for use in the Proposed Development will be subject to strict quality control procedures in accordance with the design specification and relevant Building Regulations therefore avoiding any potential issues with pyrite in aggregates.

Human Health

The site is identified as being located within a High Radon Area. The design and specification for all buildings will be in accordance with current Building Regulations and therefore any potential issues associated with radon will be addressed and avoided. Human health is assessed in Chapter 4 of this EIAR.

Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers. The necessary measures will also be implemented to address any nuisance issues associated with dust dispersion during construction works including the offsite removal of surplus soil. The potential impacts associated with airborne dust is addressed in Chapter 8 (Air and Climate) of this EIAR.

6.5.1.2 Indirect

Excavation and Removal of Soil

The construction of the Proposed Development will involve the removal and disposal offsite of up to 40,850m^3 of surplus soil and stone. The removal of soil and stone to a suitable authorised facility will be managed in accordance with the Outline Construction and Demolition Waste Management Plan (CDWMP) submitted as part of this planning application, which will be updated by the appointed Contractor in advance of works commencing and managed in accordance with all statutory obligations. The off-site re-use of material will be prioritised to minimise the potential loss of valuable good quality soil and subsoil to landfill as a waste. The re-use of soil off-site will be undertaken in accordance with all statutory requirements and obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended (referred to hereafter as Article 27).

Any surplus soil not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed off-site by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures. Accordingly, it is considered that off-site removal of surplus soil will have a 'neutral', 'imperceptible' 'permanent' impact on the receiving destination sites and facilities.

Importation of Fill Material

The Proposed Development will include the importation of 35,600m^3 aggregates during the Construction Phase of the Proposed Development. The potential impacts may include loss of attribute and changes in the geological regime at the source site. It is anticipated that the required aggregates identified for importation on-site will have a 'neutral', 'imperceptible' and 'permanent' impact on the source site taking account of the fact that the statutory consent process will require the necessary environmental impacts to be assessed and mitigated as appropriate at the source site.

In order to minimise the requirement to import virgin quarried materials, recycled aggregates will be used where available and subject to meeting specified design requirements and all construction and environmental legislation. This will include where suitable, by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011 and other applicable statutory requirements.

6.5.1.3 Secondary

There will be no secondary impacts associated with the Construction Phase of the Proposed Development.

6.5.2 Operational Phase

6.5.2.1 Direct

During the operational phase of the Proposed Development there is limited potential for any direct adverse impact on the receiving land, soil and geological environment at the Proposed Development site given the mixed use residential and retail/commercial land use and taking account of the proposed design measures for the Proposed Development.

The design and construction of the Proposed Development in accordance with current Building Regulations will ensure that the Proposed Development will be suitable for use for the Operational Phase as a given the mixed use residential and retail/commercial land use taking account of the geological site setting.

There will be no bulk storage of petroleum hydrocarbon-based fuels during the Operational Phase and the main operating system for heating will be gas based / air to water heat pump. Using such a system removes any potential contaminant sources associated with fuels.

All trafficked areas will be connected to the surface water drainage network therefore in the unlikely scenario of an accidental spill from a vehicle there will be no discharge and potential impact to ground and the receiving land, soil and geology environment.

There will be no direct impacts associated with the Operational Phase of the Proposed Development and therefore the potential impacts on land, soil and geology associated will be ‘neutral’, ‘imperceptible’ and ‘permanent’.

No public health issues associated with the land, soil, geology conditions at the site have been identified for the Operational Phase of the Proposed Development. The design and specification for all buildings will be in accordance with current Building Regulations including those relevant to previously developed land and radon, albeit not an identified issue at the site. Human health is assessed in Chapter 4 (Population & Human Health) of this EIAR.

6.5.2.2 Indirect

There will be no indirect impacts associated with the Operational Phase of the Proposed Development.

6.5.2.3 Secondary

There will be no secondary impacts associated with the Operational Phase of the Proposed Development.

6.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the cumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

The cumulative effects of the Proposed Developments on the hydrological and hydrogeological environment have been assessed taking other planned, existing and

permitted developments in the surrounding area into account. The planning history was reviewed from data sources including:

- planning website: https://www.dlrcoco.ie/en/planning-applications/planning-applications-online-search; and
- An Bord Pleanála website: http://www.pleanala.ie/.

A number of relevant planning applications have been lodged previously for lands in the vicinity of the Proposed Development site as outlined in

Table *6-4*.

Table 6-4: Recent Applications Granted Permission in the vicinity of the Proposed Development

Planning Ref. No.	Status	Summary
D20A/0015	Permitted: 06/03/2020	Location: Site located to the southeast of Glenamuck Road South, Kilternan, Dublin 18. Permission for a Phase 2B the permitted Rockville residential development (Reg. Ref: D18A/0566 and D17A/0793) comprising the construction of a four-storey apartment block comprising of 56No. residential units including 11No. 1 beds, 39Nno. 2 beds and 6Nno. 3 beds including gym facility, creche facility and private, communal and public open space.
D18A/0566 (amended by D18A/1191)	Permitted: 02/10/2018	Location: Lands south of Rockville House, Glenamuck Road South, Kilternan, Dublin 18. Addition to the permitted Rockville residential development (Reg. Ref: D17A/0793) comprising the construction of 6Nno. four-bed houses on a site south of Rockville House, with building heights of 2.5No. storeys. **Currently under construction.**
D17A/0793	Permitted: 25/01/2018	Location: Lands south of Rockville House, Glenamuck Road South, Kilternan, Dublin. This development is the first phase of development on the residential zoned lands at Rockville House comprising the construction of a total of 49 No. dwellings consisting of 37 No. detached, semi-detached and terraced 2/3 storey houses and 12 No. apartments. **Development works have been completed.**
ABP-309846-21	Permitted: 15/07/2021	Location: Enniskerry Road SHD, Adjoining Bishop's Gate Housing Development. Permission for a strategic housing development consisting of 203No. residential units (109No. houses, 94No. apartments) and a creche.
ABP-307043-20	Permitted: 28/08/2020	Location: Suttons Fields, Ballybetagh Road, Kilternan Village, Dublin 18. Permission for a strategic housing development consisting of 116No. dwellings (85No. houses and 31No. apartments) and creche.

Planning Ref. No.	Status	Summary
ABP-306160-19	Permitted: 06/04/2020	Location: Glenamuck Road, Enniskerry Road, Kilternan, Dublin 18. Permission for a strategic housing development consisting the demolition of 2No. habitable dwellings onsite and the construction of 197No. residential units (62No. houses and 115No. apartments and 20No. duplex apartments) and creche.
ABP-303978-19	Permitted: 26/06/2019	Location: Glenamuck Road South, Kilternan, Dublin 18 Permission for a strategic housing development consisting of 203 residential units within 12 No. blocks ranging in height from 3-6 No. storeys). The provision of a creche, a retail unit and a social/amenity facility. The development will include a new access from Glenamuck Road and the provision of access connection points, vehicular, cycle and pedestrian) to future adjacent development lands.
ABP-307506-20	Permission refused under ABP-307506-20 on Material Contravention technicality. Reasonable basis received on new SHD on 6th October 2021 and planning application expected to be lodged shortly.	Location: Shaldon Grange, Kilternan, Dublin 18 Permission for a phased strategic housing development to consist of the provision of 130 No. residential units, comprising 55 No. three storey houses and 75 No. apartments, ranging from three to four storeys in height. Vehicular access to the site will be from Enniskerry Road.
ABP-307043-20	Permitted: 28/08/2020	Location: Suttons Fields, Ballybetagh Road, Kilternan Village, Dublin 18. Permission for a strategic housing development consisting of 116 dwellings and creche. The dwellings will comprise: 85 No. houses and 31 No. apartments. The buildings will range from 1-3 No. storeys in height. The development will include a Main Road on its west boundary, running from Ballybetagh Road to the north boundary, that will facilitate linkage to development lands to the north. Pedestrian and cycle access will be provided from Ballybetagh Road into the site, along the west boundary of Our Lady of the Wayside National School, connecting to the site circulation roadway in the vicinity of the childcare unit.

There will be a potential cumulative loss of soils and bedrock from the area taking account to Proposed Development and the above granted developments (refer to

Table *6-4*). All surplus materials including excavated soils and bedrock from the Proposed Development site will be managed in compliance with relevant legislation. Where feasible, soils and bedrock will be re-used to prevent loss of soil and bedrock resource. Re-use of surplus soil and bedrock by-product will only be directed to other development sites for re-use under Article 27 By-Product Notification when it can be demonstrated that all tests for Article 27 compliance are met. Accordingly, it is considered that any cumulative impact on the land, soils and geology associated with the Proposed Development including in combination with other developments would be 'neutral', 'imperceptible' and 'permanent'.

The importation of aggregates to the Proposed Development may be sourced from the same borrow site as other permitted developments in the vicinity of the Proposed Development site (refer to

Table *6-4*). However, contract and procurement procedures will ensure that all aggregates and fill material originating from quarry sources that will be required for construction are sourced from reputable authorised suppliers operating in a sustainable manner and in accordance with the necessary statutory consents. Therefore, regardless of the number of other projects and developments using aggregates from the same source sites, there will be an 'indirect', 'neutral', 'imperceptible' and 'permanent' impact on the geological environmental at the source site.

Excavated and removal of surplus soils and bedrock from the Proposed Development site could potentially be directed to the same receiving soil recovery / waste facilities or sites as excavated soil and stone from other permitted developments in the vicinity of the Proposed Development site (refer to

Table *6-4*). However, as only authorised facilities will be used for the Proposed Development, the potential impacts at any authorised receiving facility or sites including waste facilities will have been adequately assessed and mitigated as part of the statutory consent procedures. Therefore, it is considered that any cumulative impact on the land, soils, geology associated with the Proposed Development would be 'neutral', 'imperceptible' and 'permanent'. The impacts associated with removal of surplus material and waste offsite is assessed in detail in Chapter 12 of this EIAR.

There are no other cumulative impacts on land, soil or geology associated with the Construction Phase and Operational Phase of the Proposed Development.

6.5.4 "Do Nothing" Impact

In the 'Do Nothing' scenario the potential impact on the receiving land, soils and geological environment of the Proposed Development did not proceed is considered.

It is considered that there would be no change or resulting impact on the nature of the Proposed Development site which would continue to be used as agricultural land and there would be no impact or change to the land, soil, geology at the Proposed Development site.

6.6 Avoidance, Remedial & Mitigation Measures

The mitigation measures, as outlined below, will ensure that there will be no significant impact on the receiving land, soil, and geology environment.

6.6.1 Construction Phase

An Outline Construction Management Plan (CMP) (Atkins Ireland, 2022), Outline Construction and Environmental Management Plan (CEMP) (Enviroguide Consulting, 2022b) and Construction and Demolition Waste Management Plan (CDWMP) (Enviroguide Consulting, 2022a) have been prepared as part of the planning application. The appointed Contractor will further develop the CMP, CEMP and CDWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground having the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA - C532', CIRIA, 2001).

The CMP, CEMP and CDWMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development.

6.6.1.1 Exportation of Soil and Bedrock

Prior to excavation, a detailed review of the final cut and fill model will be carried out to confirm cut and fill volumes. Detailed quantities of material to be excavated will be verified through accurate survey techniques and detailed in the CDWMP (Enviroguide Consulting, 2022a) which will be further developed by the appointed Contractor in advance of works commencing.

All surplus materials and any waste will be removed off-site in accordance with the requirements outlined in the CDWMP (Enviroguide Consulting, 2022a) and will be managed in accordance with all legal obligations.

The re-use of soil offsite will be undertaken in accordance with all statutory requirements and obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended.

Any surplus soil not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures.

It will be the Contractor's responsibility to either; possess a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorisations, for the collection and movement of waste off-site. Material will be brought to an authorised facility that has been adequate assessed and any potential impacts mitigated as par of statutory consent procedures. Accordingly, there will be no impact on any off-site destination site associated with the Construction Phase of the Proposed Development.

Materials and waste will be documented prior to leaving the Proposed Development Site. All information will be entered into a waste management register kept on the Proposed Development site.

Vehicles transporting material with potential for dust emissions to an off-site location will be enclosed or covered with a tarpaulin at all times to restrict the escape of dust.

Public roads outside the site will be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary. The wheels of all Lorries will be cleaned prior to leaving the site so that traffic leaving the site compound will not generate dust or cause the build-up of aggregates and fine material in the public domain. A wheel-wash or similar approved will be installed at the egress point and road sweeper will be deployed where necessary to ensure that public roads are kept free of debris.

6.6.1.2 Reuse of Soil and Stone

The reuse of excavated soil and stone for the Proposed Development (i.e., for structural fill, non-structural fill and landscaping) will be subject to testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development.

6.6.1.3 Management and Control of Soils and Stockpiles

The extent of the required work area and batter for bulk excavation at the site will be minimised where appropriate to prevent unnecessary excavation of soil and tracking over soil and subsoil outside of the excavation work areas as a result of compaction and rutting from construction traffic.

Dedicated internal haul routes will established and maintained by the contractor to prevent tracking over unprotected soils.

Exclusion zones will be established where soft landscaping is proposed in particular along site boundaries which are outside of the areas where excavation to ensure soil structure is maintained.

Segregation and storage of soils for re-use onsite or removal offsite and waste for disposal off site will be segregated and temporarily stored on-site pending removal or for reuse onsite in accordance with the CMP, CEMP and the CDWMP.

For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination reuse site or waste facility is pending, excavated soil for recovery/disposal will be stockpiled as follows:

- A suitable temporary storage area will be identified and designated;
- All stockpiles will be assigned a stockpile number;
- Soil waste categories will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the site drawings;
- Erroneous pieces of concrete will be screened from the stockpiled soils and segregated separately;
- Soil stockpiles will be sealed to prevent run-off from the stockpiled material generation and/or the generation of dust; and
- Any waste that will be temporarily stored / stockpiled only impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross contamination with soil.

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust; and
- Stockpiles will not be located near Proposed Development site boundaries or sensitive receptors and a set-back of 100m will be maintained from any boundary with offsite receptors.

When a stockpile has been sampled for classification purposes, it will be considered to be complete and no more soil will be added to that stockpile prior to disposal. An excavation/stockpile register will be maintained onsite.

Waste will be stored on-site, including concrete, asphalt and soil stockpiles, in such a manner as to:

- Prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required);
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and
- Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust)

6.6.1.4 Degradation of Soils

The segregation and stockpiling of soil and stone at the Proposed Development site pending reuse or removal offsite will be carefully managed and maintained in order to minimise potential impact on soil quality. Handling of the stockpiled soil and stone will be minimised and

will not be disturbed once formed. Stockpiles will be formed to minimise infiltration or accumulations of rainwater in the stockpiles.

6.6.1.5 Import of Fill Materials

Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations.

The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with an Article 27 By-Product Notification. Therefore, any unsuitable material will be identified and avoided prior to importation to the Proposed Development site.

6.6.1.6 Concrete Works

The cementitious grout and other concrete works during the Construction Phase, will avoid any contamination of ground through the use of appropriate design and methods implemented by the Contractor and in accordance with CMP, CEMP and relevant industry standards.

All ready-mixed concrete will be delivered to the site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

A suitable risk assessment for wet concreting will be completed prior to works being carried out.

6.6.1.7 Handling of Fuels and Hazardous Materials

Any diesel, fuel or hydraulic oils stored onsite will be stored in bunded storage tanks in a dedicated impermeable area a least 30m from watercourses. The bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005) and will be properly secured against unauthorised access or vandalism. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

Waste oils and hydraulic fluids will be collected in bunded containers and removed from the Proposed Development for disposal or re-cycling.

A procedure will be drawn up which will be adhered to during refuelling of onsite vehicles. This will include the following:

- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area;
- Fuel will be delivered to plant on-site by dedicated tanker or in a delivery bowser dedicated to that purpose;
- All deliveries to on-site oil storage tanks will be supervised and records will be kept of delivery dates and volumes;
- In the case of a bowser, the driver or supervising foreman will check the delivery bowser daily for leakage;

- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur; and
- Where the nozzle of a fuel pump cannot be placed into the tank oil storage tank then a funnel will be used.

The appointed Contractor for the Construction Phase of the Proposed Development will ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site. Only emergency breakdown maintenance will be carried out on-site. Drip trays and spill kits will be available on-site to ensure that any spills from vehicles are contained and removed off-site.

There may also be the requirement for use of portable generators or similar fuel containing equipment during the Construction Phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times.

6.6.1.8 Emergency Procedures

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the Proposed Development site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards;
- All construction works staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and
- All construction works staff on-site will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving hydrological and hydrogeological environment associated with the Construction Phase of the Proposed Development. These measures will ensure that there is minimal risk to soils and geology associated with the Construction Phase of the Proposed Development.

6.6.1.9 Welfare Facilities

Foul water discharge from the temporary welfare units at the site during the Construction Phase will be either tankered offsite in accordance with waste management legislation or

discharged under temporary consent to the IW mains foul network for treatment at Shanganagh WWTP subject to agreement with Irish Water.

6.6.2 Operational Phase

There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the Proposed Development.

6.7 "Worst Case" Scenario

The potential accidental release of hazardous material including fuels, or other hazardous materials being used on-site during the Construction Phase could potentially impact on the receiving land, soil and geology environment. This scenario would only occur through the failure of secondary containment or a major incident on the site. The potential for inadvertent import of contaminated materials during the Construction Phase could also result in an impact in the absence of the quality control measures. However, taking account of the mitigation measures any environmental harm would be avoided. There would therefore be a 'neutral', 'imperceptible' and 'short-term' impact on the receiving environment. These worst-case scenarios are deemed to be unlikely to occur.

6.8 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

The predicted impacts of the Construction and Operational Phases are described in Table 6-5 in terms of quality, significance, extent, likelihood and duration. The relevant mitigation measures are detailed, and the residual impacts are determined which take account of the avoidance, remedial and mitigation measures.

There are no significant residual impacts on land, soils and geology anticipated regarding this Proposed Development.

Table 6-5. Summary of Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Construction of the Proposed Development	Land Use and Land-Take	A land take of up to 11.153Ha will result in the change The land-use at the Proposed Development site will be changed undeveloped and agricultural lands (grazing of cattle) to mixed use residential and retail/commercial land use.	Negative	Moderate	Permanent	Direct	None required. The Proposed Development is in line with 'Objective A' and 'Objective NC' zoning objectives for the area where the Proposed Development site is located.	Moderate
Excavation and Removal of Soils and Bedrock	Soils and Bedrock	There will be an unavoidable a loss of in-situ soil, subsoil and bedrock through excavation works to achieve the formation levels for the Proposed Development including the foundations, roadways, parking, drainage infrastructure and landscaping.	Negative	Moderate	Permanent	Direct	None required. Where possible, it is intended to retain and re-use suitable excavated soil and subsoil at the Proposed Development site for engineering fill and landscaping. The removal of surplus soil offsite will be undertaken in accordance with applicable statutory requirements. This may include where suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011.	Moderate

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Excavation and Reuse of Soils and Bedrock	Soil Quality	The reuse of excavated soil and bedrock in structural fill, non-structural fill and landscaping for the Proposed Development has the potential to impact on the receiving land, soil and geology at the Proposed Development site.	Neutral	Imperceptible	Permanent	Direct	None required. The reuse of excavated soil and stone for the Proposed Development will be subject to testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development.	Imperceptible
Use of cementitious materials	Soil Quality	Potential release of cementitious material during construction works for foundations, pavements and infrastructure.	Negative	Moderate	Long-term	Direct	The cementitious materials used during construction will avoid any contamination of soil and geology through the use of appropriate design and methods implemented by the appointed Contractor and in accordance with industry standards.	Imperceptible
Accidental release of deleterious materials including fuel	Soil Quality	Potential (albeit low) for uncontrolled release of deleterious materials including fuels and other materials being used on-site,	Negative	Moderate to Significant	Long-term	Direct	Refuelling of plant during the Construction Phase will only be carried in a designated impermeable area	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
and other materials being used on-site		through the failure of secondary and tertiary containment or a materials handling accident, to the land, soil and geological environment.					onsite equipped with spillage kits. Any other diesel, fuel or hydraulic oils stored onsite or within fuel containing equipment will be stored in bunded storage tanks / drip trays.	
Stockpiling of Excavated Soils and Bedrock	Soil Structure	The excavation and reuse of soils and bedrock at the Proposed Development will result in the exposure of the materials to various elements including weather and construction traffic.	Negative	Slight	Long-term	Direct	The segregation and stockpiling of soil and stone at the Proposed Development site pending reuse or removal offsite will be carefully managed and maintained in order to minimise potential impact on soil quality.	Slight
Import of required aggregates for the construction of the Proposed Development	Land, Soil and Geology	The Proposed Development will require the importation of aggregate for use in the construction of roadways and footpaths. The potential impacts may include importation of unsuitable of contaminated materials.	Negative	Moderate to Significant	Long-term	Direct	Contract and procurement procedures will ensure that all imported aggregates meet with industry conformity/compliance standards and statutory obligations.	Imperceptible
Excavation and Removal of Surplus Soil and Stone offsite.	Land, Soil and Geology at the destination site / facility	Soil will be removed to an authorised (facility or under Article 27 Notification for appropriate re-use in accordance with all statutory obligations and consents.	Neutral	Imperceptible	Permanent	Indirect	None required.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
		Control procedures will be in place to prevent the unauthorised removal of materials to unauthorised offsite lands/sites/facilities.						
Import of required aggregates for the construction of the Proposed Development.	Land, Soil and Geology at the source site	The potential impacts may include loss of attribute and changes in the geological attribute at the source site. Only certified materials from authorised sources will be used.	Neutral	Imperceptible	Permanent	Indirect	None required.	Imperceptible
Operational Phase								
Use of the Proposed Development.	Land Soil and Geology	During the operational phase of the Proposed Development there is limited potential for any direct adverse impact on the receiving land, soil and geological environment at the Proposed Development site given the mixed use residential and retail/commercial land use and taking account of the proposed design measures for the Proposed Development.	Neutral	Imperceptible	Permanent	Direct	None	Imperceptible

6.9 Monitoring

6.9.1 Construction Phase

During construction phase the following monitoring measures will be considered:

- Inspections and monitoring will be undertaken during excavations and other groundworks to ensure that any geotechnical design measures are implemented and effective to prevent instability of soils during groundworks;
- Routine monitoring and inspections during refuelling and concrete works will be undertaken to ensure that there are no impacts and to ensure compliance with ameliorative, remedial and reductive measures.
- Monitoring and site audits will be undertaken daily by the appointed Contractor to check for any detectable nuisances such as, noise, dust, surface water runoff or other such issues associated with excavation, stockpiling and offsite removal of soil.
- Materials management and waste audits will be carried out at regular intervals to monitor the following:
    - Management of soils on-site and for removal off-site;
    - Record keeping;
    - Traceability of all materials, surplus soil and other waste removed from the Proposed Development site; and
    - Ensure records are maintained of material acceptance at the end destination.

6.9.2 Operational Phase

There are no monitoring requirements specifically in relation to land, soil and geology during the Operational Phase of the Proposed Development.

6.10 Interactions

6.10.1 Population and Human Health

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

Specific issues relating to Public Heath associated with the Proposed Development are set out in Chapter 4 of this EIAR.

6.10.2 Hydrology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. Procedures for the protection of receiving water environment are also set out in Chapter 7 of this EIAR.

6.10.3 Material Assets - Waste and Traffic

The Proposed Development will include the removal offsite of up to 40,850m^3 surplus soil and stone for reuse/recovery/disposal. An assessment of the potential impact of the Proposed Development on the material assets including built services, infrastructure and waste management is included in Chapter 12 of this EIAR.

6.10.4 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the site, with emphasis on habitats, flora and fauna which may be impacted a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

6.10.5 Landscape and Visual

During the construction phase the site landscape will undergo a change from undeveloped agricultural land to a mixed use residential and retail/commercial development. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in Chapter 10 of this EIAR.

6.10.6 Air Quality and Climate

The excavation of soils across the Proposed Development site and the temporary stockpiling of soils pending reuse or removal offsite has the potential to generate nuisance impacts (i.e., dust). An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR.

6.11 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter of the EIAR.

6.12 References

Atkins Ireland Limited, June 2022. Lands at Wayside, Kilternan Outline Construction Management Plan.

Apex Geoservices Ltd. July 2008, Report of the Geophysical Survey for the Proposed Development at Kilternan Village, Co. Wicklow.

Construction Industry Research and Information Association, 2000. Environmental Handbook for Building and Civil Engineering Projects.

Construction Industry Research and Information Association, 2015. Environmental Good Practice on Site (CIRIA – C741).

Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA – C532).

Dún Laoghaire-Rathdown County, April 2022. Dún Laoghaire-Rathdown County Development Plan 2022-2028

Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines.

Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Environmental Protection Agency, 2022. EPA Envision Maps. https://gis.epa.ie/EPAMaps/ Consulted on 25/05/2022.

Environmental Protection Agency, 2020. Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities.

Enviroguide Consulting, June 2022. Outline Construction Environmental Management Plan for Strategic Housing Development at Wayside, Enniskerry Road, Kilternan, Dublin 18.

Enviroguide Consulting, June 2022. Outline Construction and Demolition Waste Management Plan for Strategic Housing Development at Wayside, Enniskerry Road, Kilternan, Dublin 18.

Geological Society of Ireland, 2020. Geochemical Characterization and Geochemically Appropriate Levels for Soil Recovery Facilities.

Geological Society of Ireland, 2022. GSI webmapping, 2022. https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228. Consulted on 25/05/2022.

Google Earth Pro, 2022. Consulted on 25/05/2022.

Ground Investigation Ireland Ltd., February 2010. Report on Soil Infiltration Tests for Soakaway Design at Kilternan Village Site, Co. Dublin.

Ground Investigations Ireland Ltd., October 2017. Kilternan Village Ground Investigation Report.

Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide.

Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.

National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

National Parks and Wildlife Services (NPWS) webmapping 2022. https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba. Consulted on 25/05/2022.

OPR, June 2021. OPR Practice Note PN02. Environmental Impact Assessment Screening.

Ordnance Survey Ireland, 2022. Ordnance Survey Ireland webmapping http://map.geohive.ie/mapviewer.html. Consulted on 25/05/2022.

Roger Mullarkey & Associates, June 2022. Engineering Infrastructure Report and Stormwater Impact Assessment for a Residential/Commercial Development at Kilternan Village, Kilternan, Dublin 18.

Site Investigations Ltd., 2006. Ground Investigation Report;

Teagasc, 2022 webmapping. http://gis.teagasc.ie/soils/map.php. Consulted on 25/05/2022.

7 HYDROLOGY AND HYDROGEOLOGY

7.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the hydrology and hydrogeology (water) environment within and immediately surrounding the site of the Proposed Development and an assessment of the potential impacts of the Proposed Development on hydrology and hydrogeology and sets out any required mitigation measures where appropriate.

The principal objectives of this Chapter are to identify:

- Hydrological and hydrogeological characteristics of the receiving environment at the Proposed Development site;
- Potential impacts that the Proposed Development may have on the receiving water environment;
- Potential constraints that the environmental attributes may place on the Proposed Development;
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

This Chapter of the EIAR was written by Gareth Carroll BAI, Senior Environmental Consultant with Enviroguide Consulting with over 9 years' experience of environmental assessment of brownfield and greenfield sites. The Chapter was reviewed by Claire Clifford BSc., MSc., PGeo., EurGeol who is Technical Director of the Contaminated Land and Hydrogeology Division of Enviroguide Consulting and is a Professional Geologist with the Institute of Geologists of Ireland and has extensive experience in preparing environmental assessments for a range of project types and geological and hydrogeological site settings.

7.1.1 Description of the Proposed Development

The Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

The Proposed Development site layout is presented in Figure 7-7-1.

Figure 7-7-1: Proposed Development Site Layout

7.2 Study Methodology

7.2.1 Regulations and Guidance

The methodology adopted for the assessment has regard to the relevant guidelines in particular the following:

- Council Directive 80/68/EEC, 1979. On the protection of groundwater against pollution caused by certain dangerous substances. Council of European Communities.
- Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC (Water Framework Directive, WFD);
- Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (Groundwater Protection Schemes, 1999);
- Department of the Environment, Heritage and Local Government, 2009. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, 2009);

- Dún Laoghaire-Rathdown County Development Plan 2022-2028 (Dún Laoghaire-Rathdown County, April 2022);
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);
- Local Government, July 1990. No. 21.1990. Local Government (Water Pollution) (Amendment) Act, 1990.
- Local Government, March 1977. No. 01/1977. Local Government (Water Pollution) Act, 1977.
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009);
- OPR, June 2021. OPR Practice Note PN02. Environmental Impact Assessment Screening (OPR, 2021)
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 including amendments S.I. No. 327/2012, S.I. No. 386/2015 and S.I. No. 77/2019.
- S.I. No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 including amendments S.I. No. 149 of 2012 and S.I. No. 366 of 201; and
- WFD Working Group, 2005. Guidance on the Assessment of the Impact of Groundwater Abstractions (WFD, 2005).

7.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An initial Assessment and Impact Determination stage was carried out by Enviroguide Consulting to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of hydrological and hydrogeological environment, to establish the activities associated with the Proposed Development and to undertake an initial assessment and impact determination.

This stage of the assessment included a desk top study that comprised a review of published environmental information for the Proposed Development site and information provided by the Applicant. The study area, for the purposes of assessing the baseline conditions for the Hydrology and Hydrogeology Chapter of the EIAR, extends beyond the site boundaries and includes potential receptors within a 2.0km radius of the Proposed Development site (IGI, 2013).

This stage of the assessment was completed by Enviroguide Consulting and included the review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping (EPA, 2022);
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater webmapping (GSI, 2022);

- National Parks and Wildlife Services (NPWS) webmapping (NPWS, 2022);
- Ordnance Survey Ireland (OSI) webmapping (OSI, 2022);
- Water Framework Directive Ireland (WFD) webmapping (WFD, 2022);
- Teagasc webmapping (Teagasc, 2022);
- Office of Public Works (OPW) database on historic flooding and the Catchment Flood Risk Assessment and Management (CFRAM) maps (OPW, 2022); and
- Information provided by the Applicant pertaining to previous site investigations and the design proposals for the Proposed Development.

Element 2: Based on a review of the information compiled and assessed in Element 1 including site investigation data, it was determined that a direct or indirect site investigations and studies stage was not required as there was sufficient baseline information available regarding the Proposed Development site to inform the impact assessment of the Proposed Development on the receiving hydrological and hydrogeological environment.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the Construction Phase and Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Hydrology and Hydrogeology Chapter of the EIAR which includes all the associated figures and documents.

7.2.3 Description of Importance of the Receiving Environment

The National Roads Authority (NRA) criteria for estimation of the importance of hydrogeological features at the Proposed Development site during the Environmental Impact Assessment (EIA) stage, as documented by IGI (IGI, 2013) are summarised in

Table 7-1.

Table 7-1. Criteria for Rating Site Importance of Hydrogeological Features

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 European Union (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. Groundwater supports river, wetland, or surface water body. ecosystem protected by national legislation – e.g., NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale.	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale.	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality. or value on a local scale.	Poor Bedrock Aquifer. Potable water source supplying <50 homes.

7.2.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter is described in Table 7-2.

Table 7-2. Assessment of Potential Impacts Terminology and Methodology

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment
Significance of Effects / Impacts	**Definition**
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 a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects / Impacts	**Definition**
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

7.3 The Existing and Receiving Environment (Baseline Situation)

7.3.1 Site Location and Description

The Proposed Development site is located at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18 and approximately 1.9 km southwest of the M50 and Carrickmines Retail Park. The Proposed Development site location is presented in Figure 7-7-1.

The Proposed Development site is 11.2 Ha which includes the developable site area of 10.8 Ha and drainage / service works outside of the outside of the ownership boundary.

The Proposed Development site is accessed from the Enniskerry Road (R117) and currently comprises undeveloped lands and agricultural lands (grazing of cattle) with a derelict dwelling known as ‘Rockville’ and associated derelict outbuilding. The Proposed Development site is located within Kilternan Village with the surrounding land use comprising predominantly residential housing and agricultural lands.

The Proposed Development site is bounded by Glenamuck Road, Kilternan Country Market and the Sancta Maria property to the north and northwest, by Enniskerry Road to the west and southwest, by residential dwellings to the south and southeast and by agricultural lands and the Rockville residential development to the east and northeast.

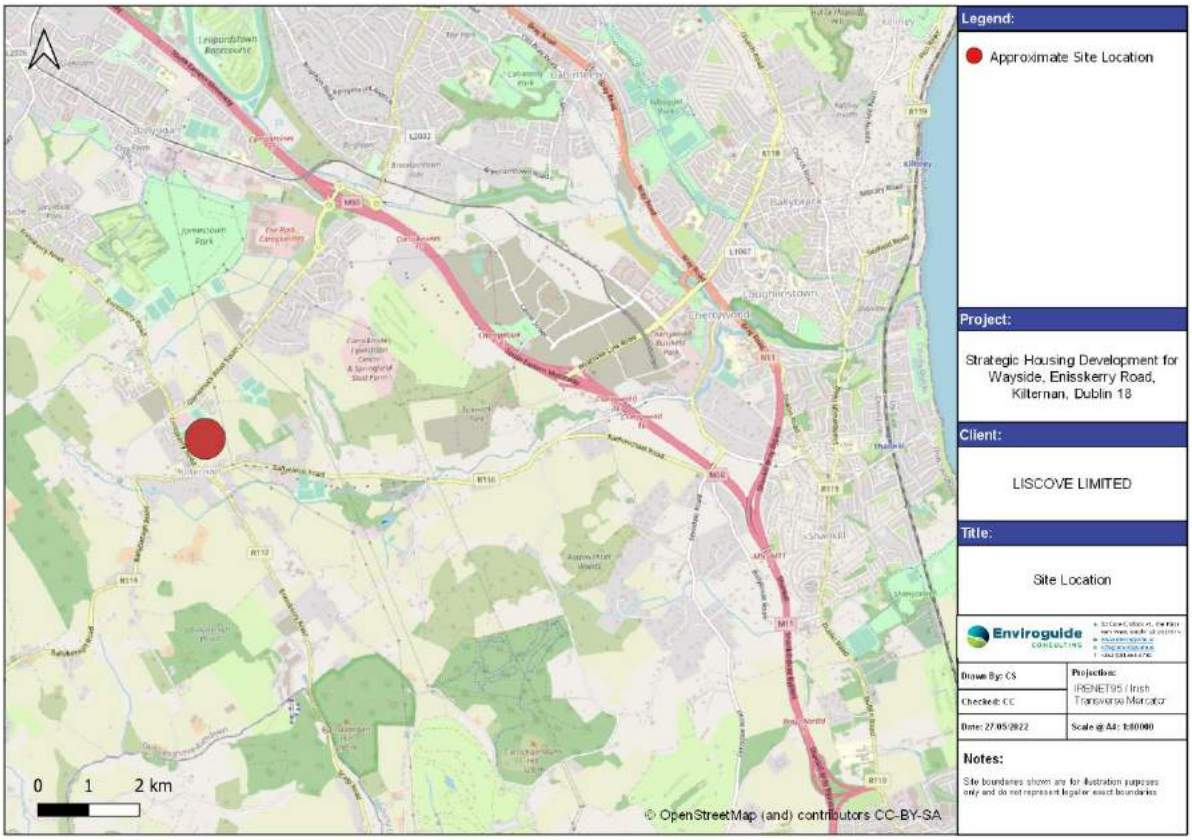

Figure 7-2: Site Location

7.3.2 Topography

The topography surrounding the Proposed Development site is generally toward the east and northeast towards the coast.

As documented in the Engineering Infrastructure Report (Roger Mullarkey & Associates, 2022), the topography at the Proposed Development site is generally a gradually increasing slope downwards from Enniskerry Road (western boundary) in a north-easterly direction and then falls off sharply toward the eastern boundary of the Proposed Development site at a gradient of approximately 10%. Ground elevations at the site range from approximately 143.07mOD in the southwest to 132.85mOD in the northeast of the Proposed Development site (Roger Mullarkey & Associates, 2022).

7.3.3 Rainfall

Monthly rainfall data available for 1km x 1km grids (for the period 1981 to 2010) was sourced from Met Éireann (Walsh, 2012) and is presented in Table 7-3.

Table 7-3: Long Term Mean Monthly Rainfall Data (mm) (Walsh, 2012)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
103	74	78	70	77	73	54	74	76	104	113	105	1001
Note: 1km x 1km Irish Grid Coordinates selected for the Site = X (Easting): 321000, Y (Northing):222000												

The closest the synoptic meteorological station to the Proposed Development site, Casement Aerodrome, is located approximately 17.55km northwest of the Proposed Development site. A summary of the average PE at Casement Aerodrome station for the period 2019 to 2022 (Met Éireann, 2022) is presented in Table 7-4.

Table 7-4: Average Potential Evapotranspiration (Met Éireann, 2022)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
15.8	22.1	34.6	52.2	71.4	80.5	81.2	68.4	47.6	27.9	15.7	13.1	530.5

The GSI (GSI, 2022) have calculated an Effective Rainfall (ER) values of between 669.1mm/year and 669.6mm/year across the Proposed Development Site.

7.3.4 Hydrology

The site has been mapped by the EPA (EPA, 2022) to be within the Ovoca-Vartry WFD Catchment (ID: 10), the Ovoca-Vartry Hydrometric Area (HA10), the Dargle_SC_010 Sub-Catchment, (Sub-catchment ID: 10_5) and the Carrickmines Stream_010 WFD River Sub Basin (IE_EA_10C040350).

The closest surface water feature is recorded on the EPA database (EPA, 2022) as the Shanganagh River (IE_EA_10S010600), named locally as the Loughlinstown River, which is located approximately 0.3km south / southeast of the Proposed Development Site and flows eastwards, discharging to the Irish Sea (South Western Irish Sea - Killiney Bay - IE_EA_G_076), approximately 5.3km east of the site.

The Glenamuck North Stream (IE_EA_10C040350) is located approximately 0.4km north of the Proposed Development Site and flows eastwards before converging with the Carrickmines Stream (IE_EA_10C040350) approximately 2.0km east of the site. The Carrickmines Stream flows approximately 3.2km downstream in a south-easterly direction before converging with the Shanganagh River approximately 3.9km east of the site (EPA, 2022). The Shanganagh River flows approximately 1.8km downstream in a south-easterly direction before discharging to the Irish Sea approximately 5.3km east of the site.

The surface water features mapped by the EPA within a 2km radius of the Proposed Development site are presented in Figure 7-3.

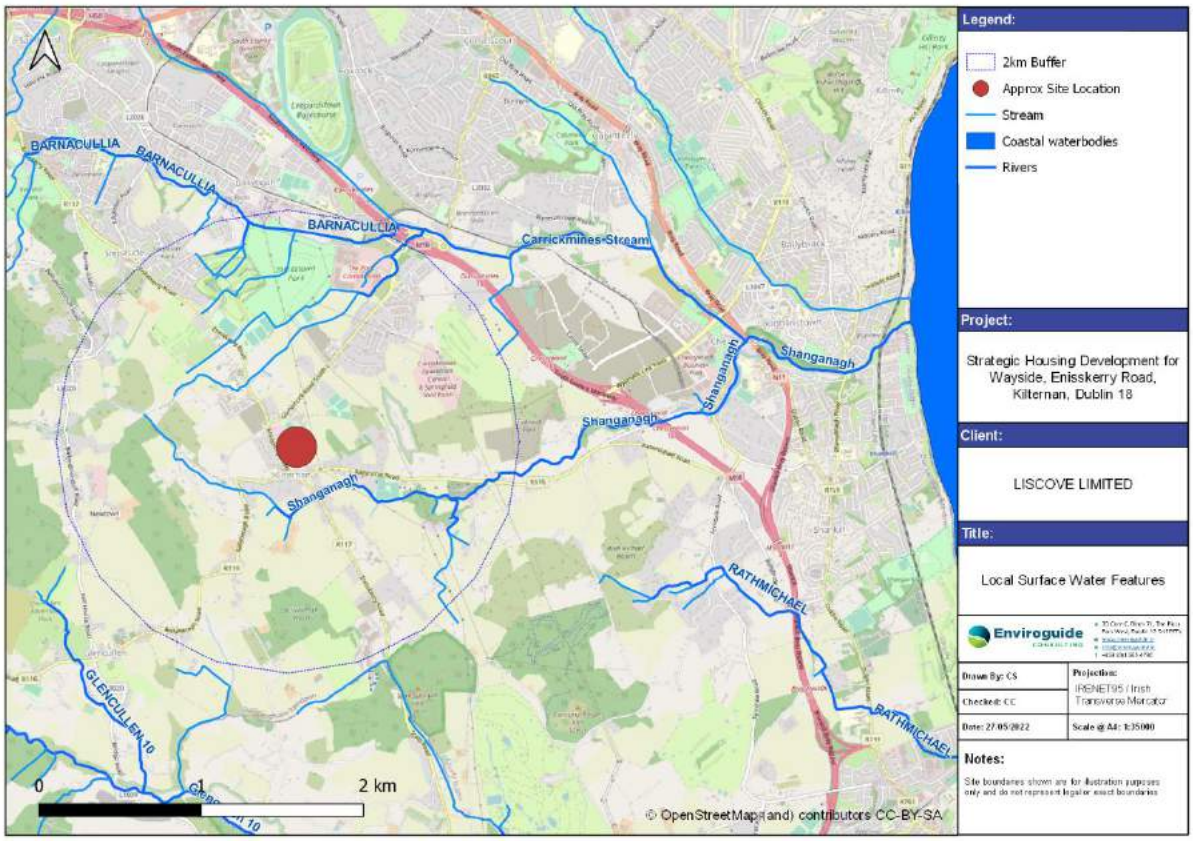

Figure 7-3: Local Surface Water Features

There is no surface water drainage at the site and no direct hydraulic connection with any water courses and surface runoff at the site discharges to ground (Enviroguide Consulting, 2022a).

There is an existing roadside drainage channel located approximately 0.02km north of the site along Glenamuck Road. It is understood that this drainage channel flows approximately 1.4km downstream in a north-easterly direction along Glenamuck Road before discharging to the Glenamuck North Stream. The Glenamuck North Stream flows approximately 0.6km downstream in a north-easterly direction before converging with the Carrickmines Stream.

7.3.5 Flood Risk

A site-specific preliminary flood risk assessment (SFRA) for the Proposed Development (Roger Mullarkey & Associates, 2022b) states that the Proposed Development site is outside the 10% AEP, 5% AEP, 1%AEP and 0.1% AEP flood extents for fluvial and coastal flooding of the Shanganagh River. The report concludes that the Proposed Development site is regarded to be of low flood risk and is suitable for development (Roger Mullarkey & Associates, May 2022b).

7.3.6 Soil and Geology

Soils and geology are assessed in Chapter 6 of this EIAR and summarised as follows:

- Soil mapped as imperfectly drained peat over lithoskelatal acid igneous rock of the Carrigvanagh (0410a) soil series and Urban' beneath the northern part and the southeast corner of the site (Teagasc, 2022).
- Subsoils mapped by the GSI (GSI, 2022) as 'till derived from granites (TGr)' with 'bedrock outcrop or subcrop (Rck)' mapped beneath the southern and northern parts of the site. Previous site investigation records indicate that cohesive soils comprising clay / silt was encountered to a maximum depth of 2.9mbGL (SII, 2006, GII, 2010 and GII, 2017).
- Bedrock is mapped as Granite - Type 3 Muscovite Porphyritic Formation (Stratigraphic Code: Nt3; New Code IDNLGR3) (GSI, 2022). Previous site investigation records indicate that bedrock was encountered as weathered Granite at depths below 0.8mbGL and 2.9mbGL (SII, 2006, GII, 2010 and GII, 2017).

7.3.7 Site Investigation and Groundwater Levels

Groundwater strikes were recorded during drilling of boreholes at the Proposed Development site (SII, 2006; borehole logs are appended to the Roger Mullarkey & Associates, 2022a Engineering Infrastructure and Stormwater Impact Assessment Report however a location map for boreholes is not included. See Appendix E of this EIAR). The groundwater strikes where encountered were recorded at depths ranging from 2.6mbGL to 2.9mbGL and typically within the sandy gravelly clays / silts above the granite bedrock.

7.3.8 Aquifer Classification

The GSI provides a methodology for aquifer classification based on resource value as regionally important, locally important, and poor.

The GSI (GSI, 2022) has classified the bedrock of the Type 3 Muscovite Porphyritic Formation beneath the Proposed Development site and surrounding area as a Poor Aquifer (Pl) (i.e. bedrock which is generally unproductive except for local zones). Poor aquifers are capable of supplying 'moderate' to 'low' yields (<100m3/day) and Groundwater flow occurs predominantly through a limited and poorly-connected network of fractures, fissures and joints (GSI, 2017).

There are no gravel aquifers mapped within a 2.0km radius of the Proposed Development site (GSI, 2022).

The bedrock aquifer map is presented in Figure 7-4.

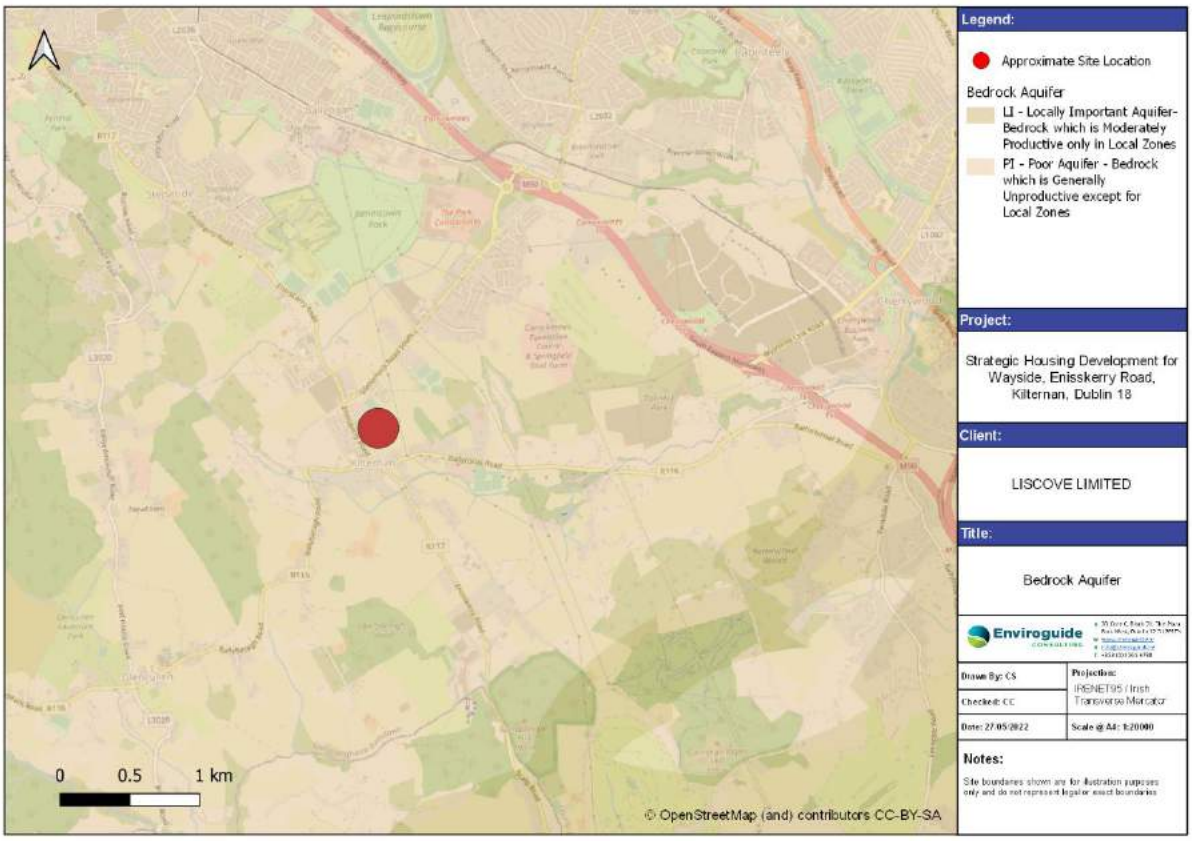

Figure 7-4: Bedrock Aquifer

7.3.9 Aquifer Vulnerability Rating

The vulnerability categories, and methods for determination, are presented in the Groundwater Protection Schemes publication (DEHLG/EPA/GSI, 1999) and summarised in Table 7-8. The publications state that '*as all groundwater is hydrologically connected to the land surface, it is the effectiveness of this connection that determines the relative vulnerability to contamination. Groundwater that readily and quickly receives water (and contaminants) from the land surface is considered to be more vulnerable than groundwater that receives water (and contaminants) more slowly and in lower quantities. The travel time, attenuation capacity and quantity of contaminants are a function of the following natural geological and hydrogeological attributes of any area:*

- *the subsoils that overlie the groundwater;*
- *the type of recharge - whether point or diffuse; and*
- *the thickness of the unsaturated zone through which the contaminant moves*'.

Table 7-5: Vulnerability Mapping Criteria (DEHLG/EPA/GSI, 1999)

Subsoil Thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	Subsoil Permeability & Type			(Swallow holes, losing streams)	(sand & gravel aquifers *only*)
	High permeability (sand & gravel)	Moderate permeability (sandy subsoil)	Low permeability (clayey subsoil, clay, peat)		
0-3m	Extreme	Extreme	Extreme	Extreme (30m radius)	Extreme
3-5m	High	High	High	N/A	High
5-10m	High	High	Moderate	N/A	High
>10m	High	Moderate	Low	N/A	High

Notes: (i) N/A = not applicable (ii) Permeability classifications relate to the material characteristics as described by the subsoil description and classification method.

The GSI have assigned a groundwater vulnerability rating of “High” (H) for the groundwater beneath the Proposed Development site (GSI, 2022) indicating approximately 3m to 10m of overburden.

As documented in the previous site investigation reports (SII, 2006, GII, 2010 and GII, 2017 included in the Roger Mullarkey & Associates, 2022a Drainage Infrastructure Report), weathered bedrock was encountered at depths below 0.8mbGL and 2.9mbGL. Therefore, the vulnerability rating of can be considered to be locally extreme based on available data for the Proposed Development site.

The GSI Groundwater Vulnerability Map is presented in Figure 7-5.

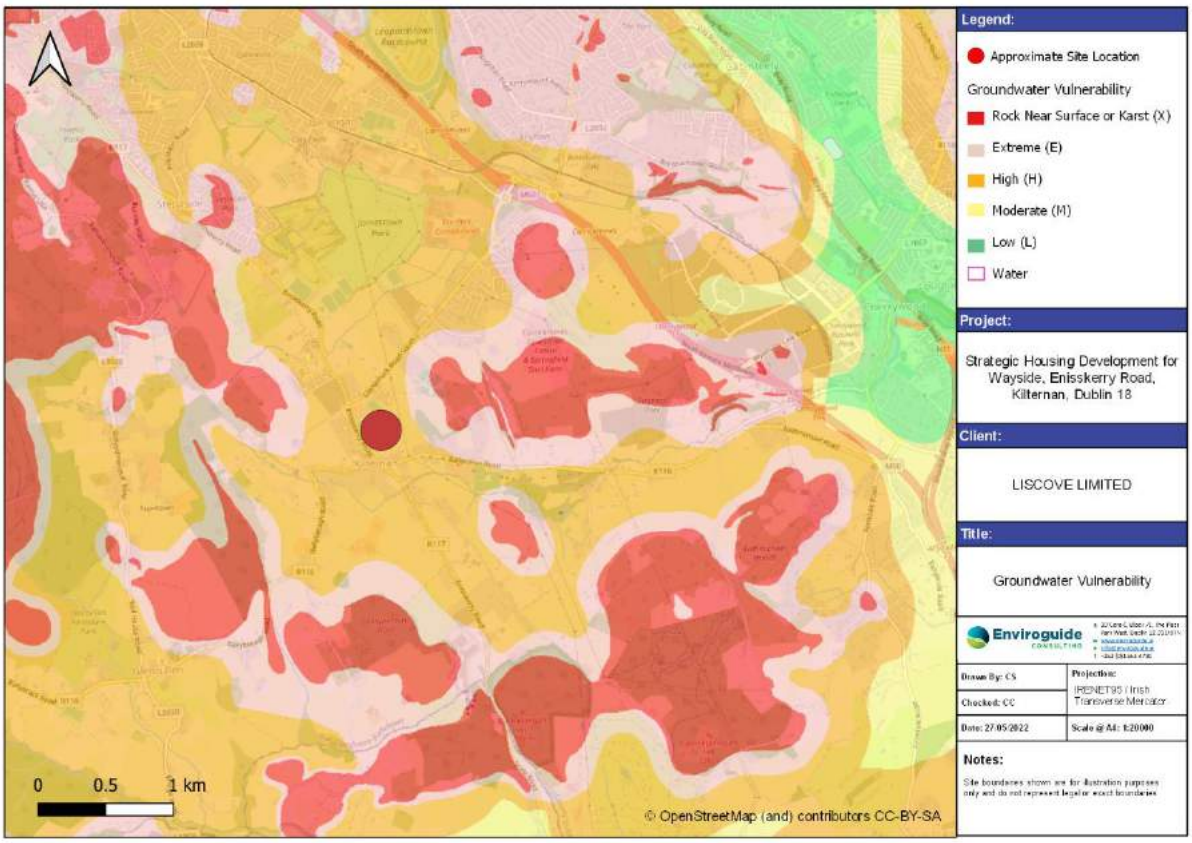

Figure 7-5: Groundwater Vulnerability

7.3.10 Groundwater Body and Flow Regimes

The bedrock aquifer beneath the site is within the Wicklow Groundwater Body (GWB) (EU Code: IE_EA_G_076). that covers some 1396km^2 and occupies an area across Co. Dublin, Co. Wicklow and Co. Wexford (GSI, 2022).

Recharge in the vicinity of the Proposed Development is diffuse through overlying tills into the aquifer. The granite aquifer beneath the site is classified as a poor aquifer which is characterised by a lower capacity to accept recharge via infiltration of rainfall. A recharge coefficient of between 20% and 60% of effective rainfall with a capped recharge value of 100mm/year has been assigned to the aquifer (GSI, 2022).

The GSI (Wicklow GWB Report) identifies that the majority of groundwater flow direction in the aquifer will take place in the upper 3m of the rocks. Site investigation results indicate that shallow groundwater where encountered, was recorded at depths ranging from 2.6mbGL to 2.9mbGL and typically within the sandy gravelly clays / silts above the granite bedrock (Enviroguide Consulting, 2022a).

Regionally groundwater flow is towards the Irish Sea with local flow towards streams and rivers (GSI, 2022). Groundwater flow in the vicinity of the site is likely to be towards the Carrickmines Stream and the Shanganagh River although baseflow contributions are noted to be low within the Wicklow GWB.

7.3.11 Water Quality

The EPA Q-Value is a system of water quality rating based on the biological quality of the water body and abundance for specific invertebrate species. A summary of the Q-value for the operational and historic EPA monitoring locations along the Carrickmines Stream and the Shanganagh River is presented in Table 7-6. The EPA data indicates that there is an upward trend in Total Ammonia and Ortho-phosphate (as P) for the water course for the period 2013-2018 (EPA, 2022).

It is noted that the Ballyogan Landfill facility (Licence Number W0015-01) is located approximately 1.3km north of the site and upstream from where the Glenamuck Stream converges with the Carrickmines Stream approximately 2.0km east and downstream of the site. The most recent available Annual Environmental Report (AER) for 2020 indicates no non-compliance issues for that reporting period.

It is also noted that the available 2020 AER for the Shanganagh WWTP indicates that discharges from the WWTP to the Irish Sea were compliant with the Emission Limit Values (ELVs).

There is no available published groundwater quality data for the Wicklow GWB in the vicinity of the Site.

Table 7-6: EPA Monitoring Stations Relevant to the Proposed Development

River I.D.	Sample Location / Monitoring Station	Q-Value (WFD Status)
Shanganagh River (0.63km upstream)	Shanganagh Middle Bridge Cabinteely Park Station I.D.: RS10S010100	3 (Poor) in 1990
Shanganagh River (0.27km downstream)	Shanganagh Kilternan Bridge Enniskerry Road Station ID: RS10S010440	3-4 (Moderate) in 2000
Shanganagh River (1.45km downstream)	Shanganagh Bridge North of Ballycorus Lead Works Station I.D.: RS10S010450	4 (Good) in 1994
Shanganagh River (4.6km downstream)	At Commons Road Station I.D.: RS10S010600	4 (Good) in 2020
Shanganagh River (4.9km downstream)	At Commons Road Station I.D.: RS10S0107000	3 (Poor) in 1984
Carrickmines Stream (2.0km downstream)	Carrickmines Stream Glenamuck Road Bridge (Friarsland / Priorsland) Station I.D. RS10C040200	3 (Poor) in 2003
Carrickmines Stream (2.9km downstream)	Carrickmines Stream Bridge near Glendruid House Station I.D. RS10C040300	3-4 (Moderate) in 1990
Carrickmines Stream (3.7km downstream)	Carrickmines Stream Upstream Overpass Station I.D. RS10C040350	4 (Good) in 2020
Carrickmines Stream (3.9km downstream)	Carrickmines Stream Bridge at Loughlinstown Station I.D. RS10C040400	3 (Poor) in 2003

7.3.12 Water Use and Source Protection

The Proposed Development site is located within an area serviced by mains water supply. The GSI groundwater wells and springs database (GSI, 2022) lists one (1No.) groundwater

well (domestic use) within a 2km radius located 0.9km south of the Proposed Development site.

There are no Groundwater Source Protection Areas (SPAs) located within a 2km radius of the Proposed Development site. The closest Groundwater SPAs to the Proposed Development Site are the Ballyfolan Group Scheme Preliminary SPA and the Roundwood Public Water Supply (PWS) which are located approximately 15.1km west and 18.5km south of the Proposed Development Site respectively.

The Shanganagh River which is located approximately 0.3km south / southeast of the Proposed Development site is mapped by the EPA (EPA, 2022) as a surface water drinking water source under Article 7 of the Water Framework Directive. There are no other surface water drinking water sources identified by the EPA (EPA, 2022) within a 2km radius of the Proposed Development site.

7.3.13 Water Framework Directive

The Water Framework Directive status for surface water, groundwater, transitional and coastal water bodies relevant to the site as recorded by the EPA (EPA, 2022) in accordance with European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003) are provided in Table 7-7.

Table 7-7: Water Framework Directive Status

Waterbody Name	Water body; EU code	Location from Site	Distance from Site (km)	WFD water body status (2013-2018)	Hydraulic Connection to the Site
Shanganagh River	IE_EA_10S010600	South / Southeast	0.27	Moderate	Cross-gradient of the Proposed Development site
Glenamuck North River	IE_EA_10C040350	North	0.42	Moderate	Cross-gradient of the Proposed Development site
Carrickmines Stream	IE_EA_10C040350	North	2.0	Moderate	Cross-gradient of the Proposed Development site
Southwestern Irish Sea -Killiney Bay	IE_EA_100_0000	East	5.21	High	Downstream of Shanganagh River
Wicklow GWB	IE_EA_G_076	N/A	N/A	Good	Underlying groundwater-body

7.3.14 Designated and Protected Areas

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 site).

The designated and protected sites are described in detail in Chapter 5 of this EIAR. The designated and protected sites located within a 15km radius of the Proposed Development Site are presented in Figure 7-6.

There are four (4No.) sites located within a 15km radius of the Proposed Development site that are identified as Special Protection Areas (SPAs), six (6No.) sites identified as Special Areas of Conservation (SACs) and twenty-three (23No.) sites that are identified as proposed National Heritage Areas (pNHAs). The findings of the Hydrogeological Risk Assessment (Enviroguide Consulting, 2022a) concluded that the closest designated and protected sites with a hydrological connection to the Proposed Development site were those associated with Shanganagh River (Loughlinstown Wood pNHA) and closest to where it discharges to the Irish Sea. The closest Natura 2000 sites to the outfall of the Shanganagh River at Killiney Bay include Rockabill to Dalkey Island SAC (003000) and Dalkey Island SPA (004172), located 1.5km and 3.2km respectively.

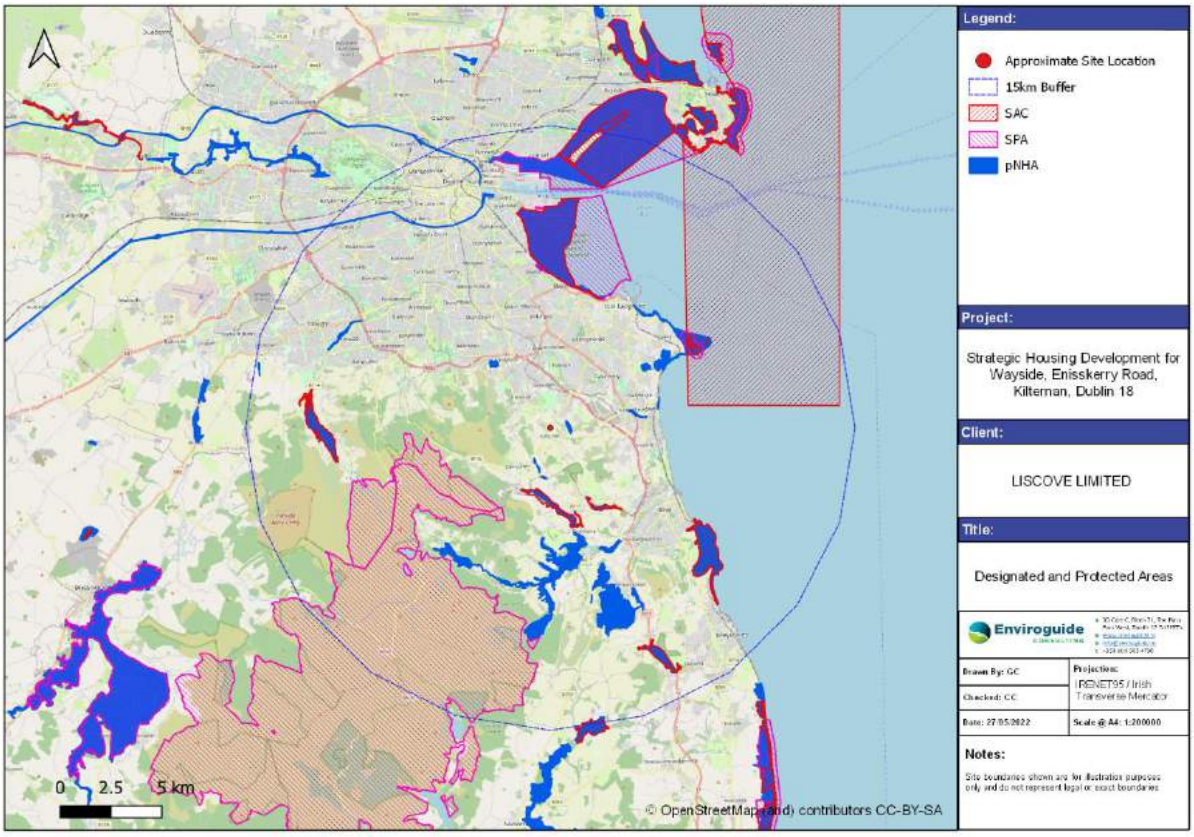

Figure 7-6: Designated and Protected Areas

7.3.15 Importance and Sensitivity of Receiving Environment

Surface runoff at the site currently infiltrates to ground and there are no water courses with a direct connection to the Proposed Development site, however there is a potential indirect connection via groundwater to downgradient catchments of the Carrickmines Stream and Shanganagh River.

Taking account of the receiving hydrogeological environment, in accordance with the criteria set out in Table 7-2 the Proposed Development site is considered to be of 'low' hydrogeological importance given that the bedrock is classified as a Poor aquifer albeit with a extreme vulnerability rating, and there only one groundwater source within 2km of the site. The Proposed Development Site is not within a mapped source protection area.

The receiving water bodies have been assigned a WFD Status of 'high' for groundwater, and 'good' for coastal water however, and 'moderate' for the closest designated surface water bodies in the vicinity of the site. There is no identified risk to designated and protected sites within the receiving coastal waterbodies the including the most sensitive (Dalkey Island SPA and Rockabill to Dalkey Island SAC) (Enviroguide Consulting, 2022).

Overall the receiving water environment in which the Proposed Development site is located is considered to be of low hydrogeological importance with a low – moderate sensitivity to impact taking account of the characteristics of the environment including WFD Status.

7.4 Characteristics of the Proposed Development

The Proposed Development is described in Section 7.1.2 and characteristics relevant to this Chapter are described in Section 7.4.1 and Section 7.4.2.

7.4.1 Construction Phase

The Construction Phase for the Proposed Development will require:

- Excavation for construction of foundations, drainage and other infrastructure to depths of 1.0m for foundations and 1.7m to 4.1mbGL for drainage and infrastructure with excavation of 72,500m^3 of soils and bedrock.
- All foundations are shallow strip foundations on bedrock with no requirement for piling. It is anticipated that excavations for foundations will be above groundwater however, locally groundwater may be encountered during deeper excavations for drainage.
- Surface water drainage infrastructure will be constructed within the Proposed Development site with connections for discharge to the existing 300mm Rockville sewer in the adjoining Rockville development (Planning Ref. D17A/0793, D18A/0566 and D20A/0015) and to the surface water drainage within the Glenamuck District Roads Scheme (GDRS) project.
- A new foul water drainage system will be constructed at the Proposed Development site with connection to the existing mains sewer existing piped foul drainage system constructed as part of the Rockville schemes (D17A/0793, D18A/0566 and D20A/0015) and the foul drainage infrastructure to be provided as part of the GDRS project in Glenamuck road. Details of the foul drainage are provided in the engineering infrastructure report (Roger Mullarkey & Associates, 2022a).

- Water supply for the Proposed Development will via new connections to the existing watermains on Enniskerry Road and on Glenamuck Road with new water mains constructed within the Proposed Development.
- Operational design details of the foul and surface water drainage as well as water supply are provided in Section 7.4.2.

7.4.2 Operational Phase

As documented in the engineering infrastructure report (Roger Mullarkey & Associates, 2022a), the surface water drainage for 9.92 Ha of the Proposed Development Site has been divided into two (2No.) catchment areas (Catchment 1 and Catchment 2) as described below. Surface water runoff from the site will be managed in accordance with the principles and objectives of Sustainable Drainage Systems (SuDS) and the Greater Dublin Sustainable Drainage System (GDSDS) to treat and attenuate water prior to the outfall points from the site (Roger Mullarkey & Associates, 2022a). The remaining areas of the site will be outside of these catchments and will continue to discharge to ground.

- Catchment 1:
    - It is proposed that attenuated surface water drainage from 9.63 Ha of the Proposed Development will outfall to the existing 300mm Rockville sewer in the adjoining Rockville development (Planning Ref. D17A/0793, D18A/0566 and D20A/0015).
    - The attenuated surface water from the existing 300mm Rockville surface water sewer discharges to the existing roadside drainage channel located on Glenamuck Road. It is understood that this drainage channel flows approximately 1.4km downstream in a north-easterly direction along Glenamuck Road before discharging to the Glenamuck North Stream.
    - The existing 300mm Rockville sewer will eventually be diverted into the regional attenuation pond for the surface water drainage network of the permitted Glenamuck District Roads Scheme (GDRS) project (ABP Ref: ABP-303945-19). Discussions with Dún Laoghaire Rathdown County Council (DLRCC) have confirmed that capacity to drain the Kilternan Village lands have been included in regional ponds (Roger Mullarkey & Associates, 2022a).
- Catchment 2:
    - It is proposed that treated and attenuated surface water drainage from 0.29Ha of the Proposed Development will outfall to the surface water drainage network of the permitted GDRS project at Glenamuck Road (ABP Ref: ABP-303945-19).
    - The GDRS project has been designed by DLRCC to facilitate the surface water drainage connection from the Site, subject to a successful grant of planning for the Proposed Development (Roger Mullarkey & Associates, 2022a).

Attenuated and treated surface water from the GDRS project will ultimately outfall to the watercourses within the catchments of the Carrickmines Stream (IE_EA_10C040350) and the Shanganagh River (IE_EA_10S010600). The Environmental Impact Assessment Report (EIAR) for the GDRS project (DBFL, March 2019) that assess the overall scheme including surface water drainage concluded that 'the significance of the identified impacts will be

reduced to a “Not significant” residual impact on the identified hydrological/ hydrogeological receptors’.

The proposed catchment areas and surface water management strategy for the Proposed Development site is present in Figure 7-7.

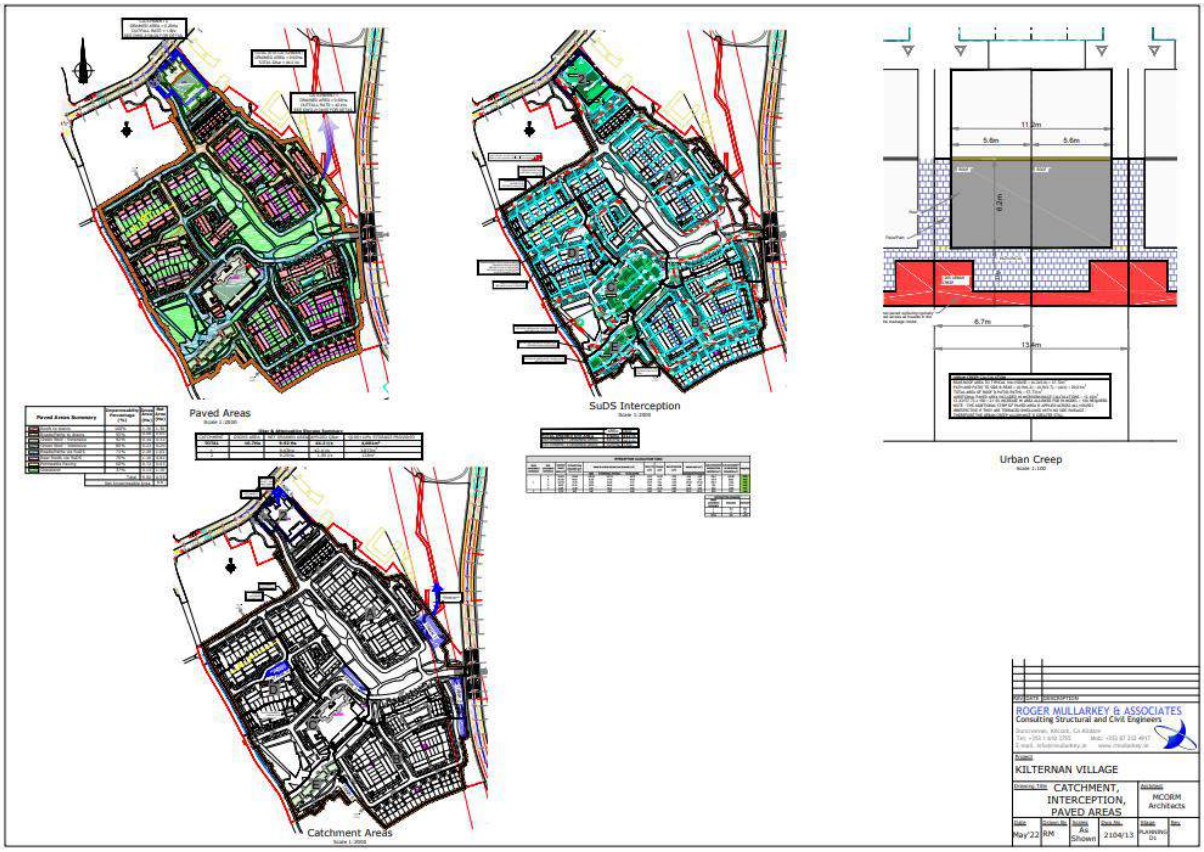

Figure 7-7: Catchment, Interception and Paved Areas (Source: Roger Mullarkey & Associates, May 2022. DWG. No. 2104/13)

Foul water from the Proposed Development will be managed within two separate drainage catchments and will ultimately discharge to Shanganagh Wastewater Treatment Plant (WWTP):

- The proposed foul outfall from 10.5 Ha of the Site will be via the existing Rockville foul sewer in the adjoining Rockville development (Planning Ref. D17A/0793, D18A/0566 and D20A/0015). This existing Rockville foul sewer ultimately outfalls downstream into the Irish Water (IW) foul sewer on Glenamuck Road.
- The proposed foul outfall from 0.3 Ha of the Site will outfall to the foul sewer network of the permitted GDRS project in Glenamuck Road (ABP Ref: ABP-303945-19). The GDRS project has been designed by Dún Laoghaire Rathdown County Council (DLRCC) to facilitate the foul drainage connection from the Site, subject to a successful grant of planning for the Proposed Development (Roger Mullarkey & Associates, 2022a).

Water supply to the Proposed Development will be from the two (2No.) existing IW water supply mains located on Enniskerry Road and on Glenamuck Road.

IW issued a Confirmation of Feasibility (COF) (Ref.CDS20006509 dated 30th May 2022) that both water supply and foul water connections from the Site are 'feasible without infrastructure upgrade by Irish Water'. Subsequently, a full design submission was made for the water and foul water infrastructure IW have issued the Statement of Design acceptance (SODA) letter (Ref.CDS20006509 issued on the 1st June 2022) (Roger Mullarkey & Associates, 2022a).

The foul water drainage and water supply infrastructure at the Proposed Development will be designed and constructed in accordance with current IW Code of Practice for Wastewater Infrastructure and the IW Code of Practice for Water Infrastructure respectively (Roger Mullarkey and Associates, 2022a).

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the Operational Phase as the main operating system for heating will be gas based / air to water heat pump and further details are provided in Chapter 12 of this EIAR.

There will be no abstraction of surface water or groundwater and no direct discharges to groundwater or surface water during the Operational Phase of the Proposed Development.

7.5 Potential Impact of the Proposed Development

7.5.1 Construction Phase

7.5.1.1 Direct

Hydrogeological Regime

There will be no discharge to groundwater or surface water during the Construction Phase.

Temporary diversions of water courses are not required for the Construction Phase, however there may be a requirement for management of surface water (rain water) and shallow groundwater where encountered during groundworks. This will be within localised areas of the site only and taking account of the urban setting of the site, the presence of clayey strata in the overburden and limited capacity of the bedrock aquifer to accept recharge there will be no overall impact groundwater recharge within the bedrock aquifer at the site.

There will be no impact on the hydrology or surface water flow regime within receiving surface water bodies during the Construction Phase.

There will be no abstraction of water for use during works (i.e. dust suppression, welfare facilities). Water supply will be from mains supply in accordance with a connection agreement from Irish Water and therefore there will be no impact on water resources.

Overall, it is considered that any impact on the hydrogeological regime of the locally important aquifer is unavoidable however will be 'negative', 'imperceptible', 'temporary' within a very localised zone of the aquifer only and there will be no impact on the flow regime of receiving water bodies.

Water Quality

Construction Phase activities at the Proposed Development site that could potentially impact on water quality include:

- Groundworks including bulk excavation of soil and if required bedrock required for subsurface infrastructure including drainage. The handling, stockpiling, reprofiling and removal offsite of soils could result in generation of excessive suspended solids in surface water runoff.
- Discharge of water that may potentially be contaminated from works areas to groundwater. There are no identified direct pathway to surface water drainage associated with the site for the Construction Phase however runoff could potentially enter onto roadways and indirectly to other offsite water receptors.
- Storage and use of fuel, oils and chemicals used during construction that are classified as hazardous. If the accidental release of hazardous material including fuels, chemicals and materials being used on-site, through the failure of secondary containment or a materials handling accident, were to occur over open ground then these materials could infiltrate to the underlying groundwater or migrate offsite.
- Imported materials including fill materials that are not of the appropriate quality could result in leaching or runoff of contaminants to the water environment.
- Export of waste materials from the site to unauthorised facilities could result in an impact on water quality at the receiving / destination site.
- Discharges or leaks from temporary welfare facilities could introduce contaminants to the water environment. Release of foul water during connection to live sewers. Due to the temporary and phased nature of the Construction Phase the potential impact from an accidental spillage is limited.
- Wheel washing discharges that could be contaminated with hydrocarbons, brake dust, metals, road salt, cleaning agents and other traffic residue.
- Release of wash water from the wheel-wash could result in localised introduction of contaminants including hydrocarbons and suspended solids to the receiving water environment.
- Piling is not required and there the associated potential impacts water quality will not occur as a result of the Proposed Development.

The potential risk to the receiving water is considered in the absence of standard and appropriate construction management and mitigation measures.

There is a potential risk associated with the cementitious materials used during the construction of deeper infrastructure where groundwater may be encountered that could result in a ‘negative’, ‘significant’ and ‘medium-term’ impact groundwater quality beneath the site. There is no requirement for instream works including concrete works.

Surface runoff entrained with sediment is unlikely to result in an impact on receiving water courses as there is no direct connection for the Construction Phase based on the existing site condition. The release of suspended solids entrained in surface runoff indirectly tracked on vehicles to haul routes to/from site within a short distance of the site (e.g. Glenamuck Road) could enter the receiving water could potentially result in a ‘negative’, ‘slight to moderate’ ‘short-term’ impact on receiving water quality.

The accidental release of hazardous material including fuels, chemicals and materials being used on-site, through the failure of secondary containment or a materials handling accident,

were to occur over open ground then these materials could infiltrate to the underlying groundwater. In the event of such scenarios, it is considered that this could result in a 'negative', 'moderate to significant', 'long-term' impact on a local area of the underlying aquifer environment depending on the nature of the incident. It is deemed unlikely that such an incident at the site would impact on receiving surface water bodies (Enviroguide Consulting, 2022a).

The release of foul water during connection to the live sewers could result in a release of contaminants to ground or as overland runoff. Due to the temporary and phased nature of the Construction Phase the potential impact from an accidental spillage is considered to be 'negative', 'moderate' and 'short-term.'

7.5.1.2 Indirect

All surplus materials and waste that will require removal offsite will be removed in accordance with the requirements and recommendations outlined in the Outline Construction and Demolition Waste Management Plan (referred to hereafter as CDWMP) (Enviroguide Consulting, 2022c) and managed in accordance with all statutory obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended (referred to hereafter as Article 27). In the unlikely event that surplus soil or other waste materials are directed to an unauthorised location there is potential to impact on the receiving hydrogeology at that location. In the event of such a scenario it is considered that this could result in a 'negative', 'slight to moderate' and 'medium-term' impact on the hydrogeology at any receiving unauthorised locations. Appropriate controls will be in place to prevent this unlikely scenario.

There will be no other indirect impacts associated with the Construction Phase of the Proposed Development.

7.5.1.3 Secondary

There will be no secondary impacts associated with the Construction Phase of the Proposed Development.

7.5.2 Operational Phase

7.5.2.1 Direct

During the Operational Phase of the Proposed Development there is limited to zero potential for any adverse impact on the receiving water (hydrological and hydrogeological) environment at the Proposed Development site taking account of the design for the Proposed Development.

Hydrogeological Regime

There will be no groundwater or surface water abstractions during the Operational Phase. The only discharge to ground will be infiltrating rainfall on areas outside the surface water drainage catchments. All surface water runoff will indirectly discharge to receiving surface water courses within the catchments of the Carrickmines Stream and Shanganagh River following onsite treatment and attenuation within the onsite surface water drainage designed in accordance with the principles and objectives of SuDS and the GDSDS (Roger Mullarkey & Associates, 2022a).

The permeability and potential for infiltration to ground at the site will be modified with the change in cover from greenfield to paved areas within the Proposed Development. The existing capacity for infiltration and recharge to the aquifer is low due to the nature of the poor granite bedrock aquifer. Therefore any a change in the recharge potential within the site taking account of the nature of the aquifer including recharge potential and localised groundwater flow paths and limited baseflow contributions within the GWB will only impact a very localised area of the aquifer within the vicinity of the site. Overall it is considered that there will be that there negative', 'imperceptible', 'long-term' impact on the Wicklow GWB and associated surface water courses.

Flood Risk

As documented in the Site-Specific Flood Risk Assessment (SSFRA) (Roger Mullarkey & Associates, 2022b) the Proposed Development site is located within Flood Zone C (less than 0.1%AEP or 1 in 1000). The SSFRA identified that the flood risk associated with each of tidal, fluvial, pluvial, groundwater and also human mechanical error (e.g. blockage of drainage) flood sources was low. It was concluded that the site is suitable for development in the context of flood risk.

Therefore, the potential flooding impacts associated with the Proposed Development are 'neutral', 'imperceptible' 'long-term'.

Water Quality

There will be no significant sources of contamination at the site during the operational phases taking account of the following embedded design considerations:

- There will be no bulk storage of petroleum hydrocarbon-based fuels used during the Operational Phase, thereby removing any potential contaminant sources associated with fuels.
- There will be no discharges to ground from drainage and only rainfall on public open spaces and landscape areas will infiltrate to ground.
- All surface water runoff including from trafficked areas (road and carparks) will be collected and managed within the surface water drainage incorporating SuDS measures as outlined in the Engineering and Infrastructure Report (Roger Mullarkey & Associates, 2022a).
- All foul water will be directed to mains sewer in accordance with agreement from Irish Water and Confirmation of Feasibility for the connection has been received from Irish Water. All below ground foul sewers will be constructed in accordance with current Irish Water requirements and Building Regulations. Therefore, any potential contaminant sources associated with drainage including foul sewers will be eliminated.

As identified in the Hydrological and Hydrogeological Risk Assessment (Enviroguide Consulting, 2020a), in the unmitigated worst-case source scenario, the discharge of surface water from Catchment 1 of the Proposed Development could result in a potential 'negative', 'significant' and short term' impact on the receiving water quality of the roadside drainage channel on Glenamuck Road, the Glenamuck North Stream and potentially within the Carrickmines Stream locally within the vicinity of the point of discharge to the Carrickmines Stream. It is considered that there would be no impact to water quality downstream where the

Carrickmines Stream confluences with at the Shanganagh River taking account of the nature of the incident and the potential for assimilation within the receiving water bodies. There would also be no impact where the Shanganagh River discharges to the Irish Sea.

Surface water from Catchment 2 of the Proposed Development will be discharged to the mains drainage network within the GDRS scheme which has been designed to incorporate discharges from the Proposed Development site (Roger Mullarkey & Associates, 2022a). The EIAR (DBFL, March 2019) prepared for the GDRS identified that discharges from the GDRS incorporating connections from the Proposed Development will have no impact on the receiving water environment. Therefore, in the unmitigated worst-case source scenario, the discharge of surface water from Catchment 2 of the Proposed Development would be diluted, treated and attenuated within the GDRS surface water drainage network prior to discharge to receiving waters and there would be no impact on the receiving water quality.

It is important to note that the surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments) in surface water runoff from roads and the impermeable areas that could potentially otherwise discharge to groundwater or the receiving water courses.

The measures incorporated in the SuDS design include filter drains, permeable paving, swales, silt-trap/catchpit manholes, tree pits, green roofing, bio-retention, attenuation storage and class1 petrol interceptors within the drainage and SuDS system. The filter drains, permeable paving, swales, silt-trap/catchpit manholes, tree pits, green roofing, bio-retention, attenuation storage will be effective in the treatment and removal of any contaminants (metals, polycyclic aromatic hydrocarbons (PAHs) and suspended solids) entrained in surface water runoff. The effectiveness of these SuDS measures is documented in TII guidance (TII,2014) and the SuDS Manual (C753). The Proposed Development also includes two (2No.) class 1 petrol interceptors prior to discharge from the site that will be effective in removal of hydrocarbons that may enter the drainage system in particular in the event of worst-case scenario spill incident (e.g. collision on the roadway resulting in the loss of fuel form a vehicle).

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development Site will be avoided taking account of the design proposals. Therefore, it is considered that the water quality protection criteria and objectives of the GDSDS and Water Framework Directive will be achieved.

There is no identified impact on the receiving water environment associated with the foul drainage at the site and discharge from the site (Enviroguide Consulting, 2022a). Foul water from the Site will ultimately discharge via the Shanganagh WWTP to the Irish Sea via the long sea outfall and short sea outfall. Foul water from the site will only be discharged to the mains foul network under the appropriate consents from IW.

7.5.2.2 Indirect

There are no indirect impacts associated with the Operational Phase of the Proposed Development.

7.5.2.3 Secondary

There are no secondary impacts associated with the Operational Phase of the Proposed Development.

7.5.3 Potential Cumulative Impacts

The following granted developments were considered in the assessment of potential cumulative impacts. Any existing developments are considered within the assessment of the baseline condition for the Proposed Development and include the granted GDRS scheme (ABP-303945-19) and Ballyogan landfill facility (Licence Number W0015-01) is located upstream of the site on the Carrickmines Stream. The larger, more recent applications considered are listed below:

- D20A/0015, D18A/1191 D17A/0793 Residential Development Lands at, Rockville House, Glenamuck Road South, Dublin 18
- ABP30397819 Strategic Housing Development at Glenamuck Road South, Kilternan, Dublin 18
- ABP-303984-19 Residential Development at Lands at and adjoining the Golden Ball Public House, Enniskerry Road, Dublin
- ABP-309846-21 Strategic Housing Development at Enniskerry Road SHD, Adjoining Bishop's Gate Housing Development.
- ABP-307043-20 Strategic Housing Development at Suttons Fields, Ballybetagh Road, Kilternan Village, Dublin 18.
- ABP-306160-19 Strategic Housing Development at Glenamuck Road, Enniskerry Road, Kilternan, Dublin 18.
- ABP-303978-19 Strategic Housing Development at Glenamuck Road South, Kilternan, Dublin 18
- ABP-307506-20 Strategic Housing Development at Shaldon Grange, Kilternan, Dublin 18 (note Permission refused under ABP-307506-20 on Material Contravention technicality. Reasonable basis received on new SHD on 6th October 2021 and planning application expected to be lodged shortly.)
- ABP-307043-20 Strategic Housing Development at Suttons Fields, Ballybetagh Road, Kilternan Village, Dublin 18.

7.5.3.1 Water Resources

The Proposed Development will be connected to the two (2No.) existing water mains on Enniskerry Road and Glenamuck Road. IW have confirmed (Ref.CDS20006509 dated 30th May 2022) that a connection is 'feasible without infrastructure upgrade by Irish Water'. Furthermore, IW have issued the Statement of Design acceptance letter (Ref.CDS20006509 issued on the 1st June 2022) (Roger Mullarkey & Associates, 2022a).The mains water supply will be operated in accordance with relevant existing statutory consents therefore there will be no cumulative impacts associated with the Proposed Development on the supply network and water resources.

7.5.3.2 Water Quality

Foul water from the Proposed Development will be discharged to the mains foul network for treatment at Shanganagh WWTP. IW have confirmed (Ref.CDS20006509 dated 30th May 2022) that a connection is 'feasible without infrastructure upgrade by Irish Water'. Furthermore, IW have issued the Statement of Design acceptance letter (Ref.CDS20006509 issued on the 1st June 2022) (Roger Mullarkey & Associates, 2022a). Therefore, it is understood that there is capacity within the network to receive and treat foul effluent from the Proposed Development. The Shanganagh WWTP is operated in accordance with relevant

statutory approvals and the available 2020 AER for the Shanganagh WWTP indicates that discharges from the WWTP to the Irish Sea were compliant with the licence Emission Limit Values (ELVs) (Irish Water, 2020). The assessment undertaken by Enviroguide Consulting (2022) identifed that there is no identified impact on the receiving environment associated with foul discharges from the Proposed Development site via Shanganagh WWTP individually or in-combination.

Surface water runoff from Catchment 2 of the Proposed Development will be discharged to the mains drainage network within the permitted GDRS scheme together with other runoff within the GDRS catchment. It has been verified by DLRCC that there GDRS design incorporates capacity for connection from the Proposed Development (Roger Mullarkey & Associates, 2022a). The EIAR (DBFL, March 2019) prepared for the GDRS and identified that discharges from the GDRS will have no impact on the receiving water environment. Accordingly, there are no identified cumulative impacts associated with the discharge of surface water drainage from Catchment 2 of the Proposed Development.

Surface water runoff from Catchment 1 of the Proposed Development will be discharged the existing drainage channel on Glenamuck Road and ultimately outfall to the Glenamuck North Stream together with other runoff within the catchment. Therefore, in the absence of mitigation, there could be a potential 'negative', 'significant' and short term' impact on the receiving water quality of the roadside drainage channel on Glenamuck Road, the Glenamuck North Stream and potentially within the Carrickmines Stream locally within the vicinity of the point of discharge to the Carrickmines Stream. However, as mentioned above, the unmitigated worst-case source scenario is deemed to be an unlikely scenario taking account of the embedded design avoidance measures and mitigation measures.

It is noted that surface water runoff from Catchment 1 of the proposed Development will eventually be diverted into the regional attenuation pond of the permitted GDRS project, which has been designed DLRCC to accommodate the Proposed Development, and as documented in the EIAR (DBFL, March 2019) there will be no cumulative impacts associated with this scenario.

There are no other potential cumulative impacts associated with the Proposed Development.

7.5.4 "Do Nothing" Impact

In the 'Do Nothing' scenario it is considered that the Proposed Development did not proceed and the potential impact on the receiving hydrological and hydrogeological environment is considered.

If the Proposed Development did not proceed the Proposed Development site would continue to be used as agricultural lands and there would be no impact or change to the hydrological and hydrogeological regime at the Proposed Development site.

7.5.5 Water Framework Directive

The findings of the risk-based assessment identified that in the absence of any mitigation or avoidance measures there could be a potential impact on the water quality within receiving water bodies associated with the site, specifically within a local zone of the Wicklow Groundwater Body during the Construction Phase. A potential 'negative', 'significant' and

'medium-term' impact to GWB status within a local portion of the Wicklow GWB could occur. Taking account of the local hydrogeological regime, there is no identified potential impact on the receiving surface water bodies via groundwater flow from the Site (Enviroguide Consulting, 2022a).

In the unmitigated worst-case source scenario at the site, and in the absence of design and mitigation measures there could be a potential 'negative', 'significant' and 'short term' impact, on the receiving WFD Status of the Glenamuck North Stream and potentially within the Carrickmines Stream locally within the vicinity of the point of discharge to the Carrickmines Stream, associated with surface water discharges from the site. Taking account of the nature of the incident, the seperation distances and the potential for assimilation within the receiving water bodies, it is considered that there would be no impact to the receiving WFD Status within the Shanganagh River and the Irish Sea.

7.6 Avoidance, Remedial & Mitigation Measures

The measures outlined in this section of the report will ensure that there will be no significant impact on the receiving groundwater and surface water environment and associated receptors (e.g., Natura 2000 sites). Therefore, the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations (S.I. 272 of 2009 and as amended) and the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010 and as amended) individually or in combination.

7.6.1 Construction Phase

The construction works will be managed with consideration of applicable regulations and standard best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005;
- BPGCS005, Oil Storage Guidelines;
- EPA (2004) IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities;
- CIRIA 697, The SUDS Manual, 2007;
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004;
- Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006);
- CIRIA C648: Control of water pollution from linear construction projects: Site guide (Murnane et al. 2006); and
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters

The CMP, CEMP and CDWMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development.

Mitigation measures will be adopted as part of the construction works on the Proposed Development site. The measures will address the main activities of potential impact which include:

- Control and Management of Water and Surface Runoff;
- Management and control of imported soil and aggregates from off-site sources;
- Fuel and Chemical handling, transport, and storage; and
- Accidental release of contaminants – notify relevant statutory authorities.

As part of the overall construction methodology, sediment and water pollution control risks arising from construction-related surface water discharges will be considered. All works carried out as part of these infrastructure works will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environment Section of Fingal County Council in this regard.

7.6.1.1 Control and Management of Water and Surface Runoff

There will be no discharges to groundwater or surface water during the Construction Phase.

Where necessary surface water at the Proposed Development site will be managed through robust water treatment methodologies in accordance with the CMP, CEMP, CDWMP and regulatory consents. Any surface water removed will be discharged into the public sewer in accordance with the necessary consent/licence issued under Section 16 of the Local Government (Water Pollution) Acts and Regulations which will be obtained from Irish Water (IW) / DLRCC.

There will be no unauthorised discharge of water (groundwater or surface water runoff) to ground, drains or water courses during the Construction Phase of the Proposed Development

There may be a temporary increase in the exposure of the underlying groundwater during earthworks due to the temporary removal of hardstanding areas. Surface water runoff will be prevented from entering open excavations with sandbags or other approved methods proposed by the Contractor.

A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.

7.6.1.2 Control and Management of Soil and Stockpiles

Where possible, stockpiling of soil and stone on-site will be avoided. However, in the event that stockpiling is required, stockpiled materials pending removal off-site or reuse on-site will be located in in designated areas only and there will be no storage of materials within 10m of any open ditches / watercourses at the Proposed Development site. Where required during periods of wet weather appropriate containment measures will be implemented to prevent excessive runoff and entrainment of sediment. These will include battering of stockpiles, covering of stockpiles with tarpaulins and use of sandbags to contain any runoff from the stockpiles.

7.6.1.3 Importation of Materials

Contract and procurement procedures will ensure that all imported aggregates, soil and other construction materials required for the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations. The importation of aggregates will be subject to management and control procedures to ensure the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Therefore, any unsuitable material will be identified prior to unloading / placement on-site.

7.6.1.4 Concrete Works

Pre-cast concrete will be used where technically feasible to meet the design requirements for the Proposed Development. Where cast-in-place concrete is required, all work will be carried out to avoid any contamination of the receiving geological environment through the use of appropriate design and methods implemented by the appointed Contractor and in accordance with the CMP, CEMP and relevant industry standards.

All ready-mixed concrete will be delivered to the Proposed Development site by truck. The following measures will be implemented where poured concrete is being used on site:

- The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site;
- Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
- Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
- Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite; and
- Surplus concrete will be returned to batch plant after completion of a pour.

7.6.1.5 Handling of Fuels and Hazardous Materials

Oils and chemicals used and stored on-site will be sealed, secured and stored in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas to prevent any seepage to ground. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

- Bunds will have regard to Environmental Protection Agency guidelines ‘Storage and Transfer of Materials for Scheduled Activities’ (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
    - 110% of the capacity of the largest tank or drum within the bunded area; or
    - 25% of the total volume of substance that could be stored within the bunded area.

- Vehicle or equipment maintenance work will take place in a designated impermeable area within the Site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines;
- Site staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and
- All staff on-site will be fully trained on the use of equipment to be used on-site.
- Portable generators or similar fuel containing equipment will also be placed on suitable drip trays or bunds.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite and will be from a road tanker brought to site as required. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the Contractor before the commencement of works onsite.

A procedure will be drawn up by the contractor which will be adhered to during refuelling of on-site vehicles. This will include the following:

- Fuel will be delivered to plant on-site by dedicated tanker;
- All deliveries to on-site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and

All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area.

Emergency Procedures

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the Proposed Development Site;

- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development Site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards;
- All construction works staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and
- All construction works staff on-site will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving hydrological and hydrogeological environment associated with the Construction Phase of the Proposed Development.

7.6.1.6 Welfare Facilities

Foul water discharge from the temporary welfare units at the Site during the Construction Phase will be either tankered offsite in accordance with waste management legislation or discharged under temporary consent to the IW mains foul network for treatment at Shanganagh WWTP subject to agreement with Irish Water.

7.6.2 Operational Phase

There will be no risk to water quality including groundwater and surface water associated with the Operational Phase of the Proposed Development. It is considered that the design of the Proposed Development is in line with the objectives of the Water Framework Directive (2000/60/EC), as amended (WFD) to prevent or limit any potential impact on water quality.

There will be no petroleum hydrocarbon-based fuels used during the operational phase and the main operating system for heating will be will be gas based / air to water heat pump, thereby removing any potential contaminant sources associated with fuels.

There will be no discharges to ground from drainage and only rainfall on public open spaces will infiltrate to ground.

All drainage from paved areas along roads and impermeable roads will be collected and managed within the surface water drainage and SuDS solutions as outlined in the Infrastructure Report (Roger Mullarkey & Associates, 2022a).

The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments) in surface water runoff from the higher risk areas including roads and the impermeable areas that could potentially otherwise discharge to groundwater or receiving water courses in the vicinity the site. The measures incorporated in the SuDS design include, filter drains, permeable paving, swales, silt-trap/catchpit manholes, tree pits, green roofing, bio-retention, attenuation storage and class1 petrol interceptors within the drainage and SuDS system. The filter drains, permeable paving, swales, silt-trap/catchpit manholes, tree pits,

green roofing, bio-retention, attenuation storage will be effective in the treatment and removal of any contaminants (metals, polycyclic aromatic hydrocarbons (PAHs) and suspended solids) entrained in surface water runoff. The effectiveness of these SuDS measures is documented in TII guidance (TII,2014). The Proposed Development also includes two (2No.) class 1 petrol interceptors prior to discharge from the site that will be effective in removal of hydrocarbons that may enter the drainage system in particular in the event of worst-case scenario spill incident (e.g., collision on the roadway resulting in the loss of fuel form a vehicle).

Ongoing regular maintenance of the proposed drainage including the SuDS measures in accordance with CIRIA SuDS Manual C753 will be incorporated into the overall management strategy for the Proposed Development.

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development Site will be avoided taking account of the design proposals. Therefore, it is considered that the water quality protection criteria and objectives of the GDSDS and Water Framework Directive will be achieved

There is no other requirement for mitigation measures for the Operational Phase of the Proposed Development.

7.7 "Worst Case" Scenario

During the Construction Phase, in a worst-case scenario, such as a fuel spill or accidental unmitigated release of other hazardous compounds occurring, and in the absence of any mitigation measures it is considered that there would be a potential 'negative', 'significant', ' medium term' impact on the quality of a localised zone of the aquifer (Enviroguide Consulting, 2022a).

During the Operational Phase, in the event of the worst-case source scenario (i.e., accidental release of fuel) with unmitigated discharge of potentially contaminated surface water runoff it is considered that there would be a localised 'negative', 'significant', 'short term' impact on the quality of the receiving roadside drainage channel on Glenamuck Road, the Glenamuck North Stream and potentially within the Carrickmines Stream locally within the vicinity of the point of discharge to the Carrickmines Stream.

However, these worst-case scenarios are deemed to be unlikely scenarios taking account of the embedded design avoidance measures and mitigation measures.

7.8 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

The predicted impacts of the Construction and Operational Phases are described in Table 7-8 in terms of quality, significance, extent, likelihood, and duration. The relevant mitigation measures are detailed, and the residual impacts are determined which take account of the avoidance, remedial and mitigation measures.

There are no significant residual impacts on hydrology and hydrogeology anticipated regarding this Proposed Development.

There will be no impact to the existing WFD Status of water bodies associated with the Proposed Development including the Glenamuck North Stream, the Carrickmines Stream, the Shanganagh River, Southwestern Irish Sea – Killiney Bay and the Wicklow GWB as a result of the Proposed Development taking account of design avoidance and mitigation measures where required.

Table 7-8: Summary of Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Groundworks and management of water.	Hydrogeological Regime	Localised temporary impacts within the site only on hydrogeological regime.	Negative	Imperceptible	Temporary	Direct	None Required.	Imperceptible
Use of cementitious materials.	Water Quality	Potential release of cementitious material during the construction of foundations, pavements, and other structures.	Negative	Significant	Medium Term	Direct	The design will incorporate the use of pre-cast concrete structures where appropriate. The Contractor will carry out works in accordance with industry standards.	Imperceptible
Surface runoff containing contaminants or suspended solids.	Surface Water	Potential for contaminants entrained in surface runoff to enter the receiving drainage channels on lands adjoining the Proposed Development Site.	Negative	Slight to Moderate	Short term	Direct/Indirect	Site works will be managed to prevent runoff migrating offsite. Wheel wash facilities will be used to prevent tracking of debris to haul routes that may runoff to water courses.	Imperceptible
Accidental release of deleterious materials including fuel and other materials	Groundwater / Surface Water	Potential to impact on a localised zone of the aquifer. It is deemed unlikely to impact on receiving surface water bodies.	Negative	Moderate Significant	Long Term	Direct	Refuelling of plant during the Construction Phase will only be carried in a designated impermeable area	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
being used on-site.							onsite equipped with spillage kits. Any other diesel, fuel or hydraulic oils stored onsite or within fuel containing equipment will be stored in bunded storage tanks / drip trays.	
Construction of foul drainage and connection to live sewers.	Groundwater	The release of foul water during connection to the live sewers could result in a release of contaminants to ground or as overland runoff.	Negative	Moderate	Short Term	Direct	Foul water drainage infrastructure will be designed and constructed in accordance with current guidelines. Procedures will be in place for the connection to prevent any accidental release during works.	Imperceptible
Earthworks – removal of surplus material and waste.	Water quality	Potential for impact on water environment at destination site/facility.	Negative	Slight to Moderate	Medium-Term	In-direct	All surplus material and waste material will be removed offsite in accordance with detailed procedures in strict accordance with all waste management legislation and the procedures outlined	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
							in the CEMP/CDWMP.	
Construction Activities.	Water quality / WFD Status	Potential for impact on Wicklow GWB within a localised zone in the event of a worst case scenario occurring.	Negative	Significant	Medium Term	Direct / Worst Case	Appropriate mitigation measures to prevent the worst case scenario occurring will be implemented by the Contractor.	Imperceptible
Operational Phase								
Modification of the Surface Cover.	Hydrogeological Regime	Potential for localised variations in recharge potential however, taking account of the nature of the aquifer and limited capacity to accept recharge a localised impact only may occur.	Negative	Imperceptible	Long Term	Direct	None Required.	Imperceptible
Surface Water Drainage / Proposed Development .	Flood Risk	The Site-Specific FRA identified that there is no risk of flood associated with the Proposed Development.	Neutral	Imperceptible	Long Term	Direct	None Required. Ongoing maintenance of the SUDS and drainage network will be undertaken.	Imperceptible
Surface Drainage	Water quality	Potential for impact on the receiving water quality associated with the discharge of surface water runoff from Catchment 1 to the roadside drainage channel on Glenamuck Road.	Negative	Significant	Short Term	Direct (also Cumulative)	The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals,	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
							and suspended sediments) in surface water runoff from THE Proposed Development. Ongoing maintenance of the SUDS and drainage network will be undertaken.	
Surface Drainage.	Water quality	The discharge of surface water from Catchment 2 to the mains drainage network for the GDRS will not result in any impact on the receiving water quality.	Neutral	Imperceptible	Long Term	Direct (also Cumulative)	None Required.	Neutral
Foul Drainage.	Water quality	The discharge of foul water from the Proposed Development to the mains foul network under the appropriate consents from IW will not result in any impact on the receiving water quality.	Neutral	Imperceptible	Long Term	Direct (also Cumulative)	None Required.	Neutral
Surface Drainage / Foul Drainage.	WFD Status	In the absence of design and mitigation measures there could be a potential impact, on the receiving water quality and potentially WFD Status of the Carrickmines Stream.	Negative	Significant	Short Term	Direct	The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments) in surface	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
							water runoff from THE Proposed Development. Ongoing maintenance of the SUDS and drainage network will be undertaken.	

7.9 Monitoring

7.9.1 Construction Phase

There are no monitoring requirements specifically in relation to hydrology and hydrogeology during the Construction Phase of the Proposed Development.

7.9.2 Operational Phase

There are no monitoring requirements specifically in relation to hydrology and hydrogeology during the Operational Phase of the Proposed Development.

7.10 Interactions

7.10.1 Population and Human Health

No public health issues associated with the water (hydrology and hydrogeology) conditions at the Proposed Development Site have been identified for the Construction Phase or Operational Phase of the Proposed Development.

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

It is noted that specific issues relating to Public Heath associated with the Proposed Development are set out in Chapter 4 of this EIAR.

7.10.2 Material Assets - Water

An assessment of the potential impact of the Proposed Development on the Material Assets including built services, infrastructure, traffic, and waste management has been set out in Chapter 12 of this EIAR. Any discharges to the public foul sewer and water supply to the Proposed Development will be under consent from Irish Water.

7.10.3 Land, Soil, Geology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment during the Operational Phase of the Proposed Development is set out in Chapter 6 Land, Soil and Geology of this EIAR.

7.10.4 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

7.11 Difficulties Encountered When Compiling

There were no difficulties encountered when compiling the Hydrology and Hydrogeology Chapter of this EIAR.

7.12 References

Atkins Ireland Limited, June 2022. Lands at Wayside, Kilternan Outline Construction Management Plan.

Apex Geoservices Ltd. July 2008, Report of the Geophysical Survey for the Proposed Development at Kilternan Village, Co. Wicklow.

Council Directive 80/68/EEC, 1979. On the protection of groundwater against pollution caused by certain dangerous substances. Council of European Communities.

Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.

Construction Industry Research and Information Association, 2000. Environmental Handbook for Building and Civil Engineering Projects.

Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites (CIRIA – C532).

Construction Industry Research and Information Association, 2011. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.

Construction Industry Research and Information Association, 2015. Environmental Good Practice on Site (CIRIA – C741).

Construction Industry Research and Information Association, 2007. The SuDS Manual (CIRIA – C697).

Dún Laoghaire-Rathdown County, April 2022. Dún Laoghaire-Rathdown County Development Plan 2022-2028.

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC.

Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines.

Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Environmental Protection Agency, 2022. Catchments webmapping https://www.catchments.ie/maps/. Consulted on 25/05/2022.

Environmental Protection Agency, 2022. EPA HydroNet webmapping and databases. http://www.epa.ie/hydronet/#Water%20Levels. Consulted on 22/09/2021.http://www.epa.ie/hydronet/#Water%20Levels. Consulted on 25/05/2022.

Environmental Protection Agency, 2022. EPA Envision Maps. https://gis.epa.ie/EPAMaps/. Consulted on 22/09/202125/05/2022.

Enviroguide Consulting, June 2022a. Hydrological and Hydrogeological Risk Assessment for Strategic Housing Development at Wayside, Enniskerry Road, Kilternan, Dublin 18.

Enviroguide Consulting, June 2022b. Outline Construction Environmental Management Plan for Strategic Housing Development at Wayside, Enniskerry Road, Kilternan, Dublin 18.

Enviroguide Consulting, June 2022c. Outline Construction and Demolition Waste Management Plan for Strategic Housing Development at Wayside, Enniskerry Road, Kilternan, Dublin 18.

Geological Survey Ireland, 2022. GSI webmapping. https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228. Consulted on 22/09/2021.https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228. Consulted on 25/05/2022.

Geological Survey Ireland, 2022. Groundwater Body Reports, Wicklow GWB. https://secure.dccae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/WicklowGWB.pdf . Consulted on 25/05/2022.

Geological Survey Ireland, 2017. A Description of Irish Aquifer Categories (version 1.1). https://www.gsi.ie/documents/GSI%20Aquifer%20Category%20Descriptions.pdf

Google Earth Pro, 2022. Consulted on 25/05/2022..

Ground Investigation Ireland, February 2010. Report on Soil Infiltration Tests for Soakaway Design at Kilternan Village Site, Co. Dublin.

Ground Investigations Ireland Ltd., October 2017. Kilternan Village Ground Investigation Report.

Institute of Geologists of Ireland, 2013. Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.

Met Éireann, 2012. Séamus Walsh, 'Long-term climate averages for Ireland 1981 - 2010', [IE_RR_8110_V1] (Walsh, 2012).

National Parks and Wildlife (NPWS) webmapping 2022. https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba. Consulted on 22/09/2021.https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba. Consulted on 25/05/2022.

National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

Ordnance Survey Ireland, 2020 (OSI, 2022). Ordnance Survey Ireland webmapping http://map.geohive.ie/mapviewer.html. Consulted on 25/05/2022.

Office of Public Works, 2022. OPW Flood Risk webmapping. https://www.floodinfo.ie/map/floodmaps/. Consulted on 22/09/2021.https://www.floodinfo.ie/map/floodmaps/. Consulted on 25/05/2022.

Roger Mullarkey and Associates, May 2022. Engineering Infrastructure Report and Stormwater Impact Assessment for a Residential/Commercial Development at Kilternan Village, Kilternan, Dublin 18.

Roger Mullarkey and Associates, May 2022. Site Specific Flood Risk Assessment for a Residential/Commercial Development at Kilternan Village, Kilternan, Dublin 18.

Site Investigations Ltd., 2006. Ground Investigation Report;

Teagasc, 2022 webmapping. http://gis.teagasc.ie/soils/map.php. Consulted on 22/09/2021.http://gis.teagasc.ie/soils/map.php. Consulted on 25/05/2022.

Water Framework Directive, 2022. Water Framework Directive web mapping - http://watermaps.wfdireland.ie/NsShare_Web/. Consulted on 25/05/2022.

8 AIR QUALITY AND CLIMATE

8.1 Introduction

This Chapter describes and assesses the potential impacts on air quality and climate associated with the Proposed Development at Wayside, Kilternan, Dublin 18. The Chapter was prepared by Aoife Grogan (BA Hons, MSc) and Laura Griffin (BA Hons, MSc), Environmental Consultants, Enviroguide Consulting, Aoife and Laura have experience working on a number of EIARs and EIA Screening Reports for projects of a similar scale to the Proposed Development.

Taking into account Ambient Air Quality Standards, the baseline air quality was examined along with the potential for release of emissions to the atmosphere and associated effects prior to and following mitigation measures. This Chapter also describes and assesses the potential impacts on micro and macro-climate as a result of the Proposed Development. Attention is focused on Ireland's obligations under the Kyoto Protocol in the context of the overall climatic impact of the presence and absence of the Proposed Development.

8.1.1 Ambient Air Quality Standards

For the protection of health and ecosystems, EU Directives apply air quality standards in Ireland and other EU member states for a range of pollutants. These rules include requirements for monitoring, assessment and management of ambient air quality. The first major instrument in tackling air pollution was the Air Quality Framework Directive 96/62/EC and its four daughter Directives, which prescribed standards for various pollutants:

- **1st Daughter Directive:** Sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter, and lead
- **2nd Daughter Directive:** Carbon monoxide and benzene
- **3rd Daughter Directive:** Ozone
- **4th Daughter Directive:** Polyaromatic hydrocarbons, arsenic, nickel, cadmium, and mercury in ambient air.

The Air Quality Framework Directive set out a number of objectives as follows;

- Implements an EU-wide system for setting and binding air quality objectives for specified pollutants to protect human health and the environment;
- Requires Member States to put systems in place for assessing the quality of ambient air in accordance with common assessment criteria;
- Requires Member States to maintain ambient air quality where it is good and improve it in other cases through plans and programmes of action;

- Lays down requirements for a system of gathering, reporting and publicising information inclusive of data to be reported to the European Commission and information to be circulated to the public.

Ambient air quality monitoring and assessment in Ireland is carried out in accordance with the requirements of the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) which was published in May 2008. This Directive replaced the Air Quality Framework Directive and the first, second and third Daughter Directives. The CAFE Directive has been transposed into Irish legislation by the Air Quality Standards Regulations (S.I. No. 180 of 2011); replacing the Air Quality Standards Regulations (2002) and the Ozone in Ambient Air Regulations (2004). The CAFE Directive required EU member states to designate 'Zones' reflective of population density for the purpose of managing air quality. Four zones were defined in the Air Quality Standards Regulations (2011) and subsequently amended in 2013 to account for 2011 census population counts and to align with coal restricted areas in the 2012 Regulations (S.I. No. 326 of 2012).

The main areas defined in each zone are:

- **Zone A:** Dublin Conurbation
- **Zone B:** Cork Conurbation
- **Zone C:** Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.
- **Zone D:** Rural Ireland, i.e., the remainder of the State excluding Zones A, B and C.

The site of the Proposed Development is located in Kilternan, Dublin 18 and falls under the 'Zone A' category based on the EPA CAFE Directive.

The Cleaner Air for Europe (CAFE) Directive outlines certain limit or target values specified by the five published directives that apply limits to specific air pollutants. These limits, outlined in Table 8-1, will be referred to as part of the proposed facility assessment with respect to air quality.

Table 8-1: Limit Values of Cleaner Air for Europe (CAFE) Directive 2008/50/EC (Source: EPA, 2020)

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m3	Limit Value ppb	Basis of Application of the Limit Value	Limit Value Attainment Date
SO_2	Protection of Human Health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year	1 Jan 2005
SO_2		24 hours	125	47	Not to be exceeded more than 3 times in a calendar year	1 Jan 2005
SO_2	Protection of vegetation	Calendar year	20	7.5	Annual mean	19 July 2001
SO_2		1 Oct to 31 Mar	20	7.5	Winter mean	19 July 2001
NO_2	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year	1 Jan 2010
NO_2		Calendar year	40	21	Annual mean	1 Jan 2010
NO + NO_2	Protection of ecosystems	Calendar year	30	16	Annual mean	19 July 2001
PM10	Protection of human health	24 hours	50	-	Not to be exceeded more than 35 times in a calendar year	1 Jan 2005
PM10		Calendar year	40	-	Annual mean	1 Jan 2005
PM2.5 - Stage 1		Calendar year	25	-	Annual mean	1 Jan 2015
PM2.5 - Stage 2		Calendar year	20	-	Annual mean	1 Jan 2020
Lead		Calendar year	0.5	-	Annual mean	1 Jan 2005
Carbon Monoxide		8 hours	10,000	8,620	Not to be exceeded	1 Jan 2005
Benzene		Calendar year	5	1.5	Annual mean	1 Jan 2010

The EPA is the competent authority for the purpose of the CAFE Directive and is required to send an annual report to the Minister for Environment and the European Commission. The regulations further provide for the distribution of public information. This includes information on any exceedances of target values, the reasons for exceedances, the area(s) in which they occurred, and the relevant information regarding effects on human health and environmental impacts.

8.1.2 Climate Agreements

Climate change is recognised as one of the most serious global environmental problems and arguably the greatest challenge facing humanity today. While natural variations in climate over time are normal, anthropogenic activities have interfered greatly with the global atmospheric system by emitting substantial amounts of greenhouse gases (GHGs). This has caused a discernible effect on our global climate system, with continued change expected due to current and predicted trends of GHG emissions. In Ireland this is demonstrated by rising sea levels, changes in the ecosystem, and extreme weather events.

In March 1994, the United Nations Framework Convention on Climate Change (UNFCCC) was established as an intergovernmental effort to tackle the challenges posed by climate change. The Convention membership is almost universal, with 197 countries having ratified. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices. This information is then utilised to launch national strategies and international agreements to address GHG emissions. Following the formation of the UNFCCC, two major international climate change agreements were adopted: The Kyoto Protocol, and the Paris Agreement.

In April 1994, Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) and subsequently signed the Kyoto Protocol in 1997. The Kyoto Protocol is an international agreement linked to the UNFCCC which commits its parties to legally binding emission reduction targets. In order to ensure compliance with the protocol, the Intergovernmental Panel on Climate Change (IPCC) has outlined detailed guidelines on compiling National Greenhouse Gas Inventories. These are designed to estimate and report on national inventories of anthropogenic GHG emissions and removals. Under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six named GHGs to 13% above the 1990 level, spanning the period 2008 to 2012.

The second commitment period of the Kyoto Protocol, the Doha amendment, was adopted *in extremis* on the 8th of December 2012, to impose quantified emission limitation and reduction commitments (QELRCs) to Annex I (developed country) Parties during a commitment period from 2013 to 2020. 38 developed countries, inclusive of the EU and its 28 member states, are participating. Under the Doha amendment, participating countries have committed to an 18% reduction in emissions from 1990 levels. The EU has committed to reducing emissions in this period to 20% below 1990 levels. Ireland's QELRCs for the period 2013 to 2020 is 80% of its base year emissions. Ireland's compliance with the Doha amendment will be assessed based on the GHG inventory submission in 2022 for 1990-2020 data. As of October 2020, the Doha Amendment has received the required number of ratifications to enter force. Once in force, the emission reduction commitments of participating developed countries and economies in transition (EITs) become legally binding.

In principle, industrialised countries still have obligations under the Kyoto Protocol, but a later treaty, the Paris Climate Agreement of 2015, has now superseded it. In December 2015, the Paris Climate Conference (COP21) took place and was an important milestone in terms of international climate change agreements. The Paris Agreement sets out a global action plan to put the world on track to mitigate dangerous climate change by setting a global warming limit not to exceed 2°C above pre-industrial levels, with efforts to limit this to 1.5°C. As a contribution to the objectives of the agreement, countries have submitted comprehensive national climate action plans (nationally determined contributions, NDCs). Under this agreement, governments agreed to come together every 5 years to assess the collective progress towards the long-term goals and inform Parties in updating and enhancing their nationally determined contributions. Ireland will contribute to the Agreement through the NDC tabled by the EU on behalf of Member States in 2016, which commits to a 40% reduction in EU-wide emissions by 2030 compared to 1990. All Parties are required to submit new or updated NDCs in 2020.

The EU has set itself targets for reducing its GHG emissions progressively up to 2050, these are outlined in the 2020 climate and energy package and the 2030 climate and energy policy framework. These targets are defined to assist the EU in transitioning to a low-carbon economy, as detailed in the 2050 low carbon roadmap. The 2020 package is a set of binding legislation to ensure that the EU meets its climate and energy targets for the year 2020. There are three key targets outlined in the package which were set by the EU in 2007 and enacted in legislation in 2009:

- 20% reduction in GHG emissions from 1990 levels.
- 20% of EU energy to be from renewable sources.
- 20% improvement in energy efficiency.

The 2030 climate and energy framework builds on the 2020 climate energy package and was adopted by EU leaders in October 2014. The framework sets three key targets for the year 2030:

- At least 40% cuts in GHG emissions from 1990 levels;
- At least 32% share for renewable energy;
- At least 32.5% improvement in energy efficiency.

The EU has acted in several areas in order to meet these targets, including the introduction of the Emissions Trading System (ETS). The ETS is the key tool used by the EU in cutting GHG emissions from large-scale facilities in the power, industrial, and aviation sectors. Around 45% of the EU's GHG emissions are covered by the ETS. The 2020 target for total GHG emissions from these sectors is set at 21% below 2005 levels.

8.1.2.1 National Policy Position and Greenhouse Gas Emmissions in Ireland

National climate policy in Ireland recognises the threat of climate change to humanity and supports mobilisation of a comprehensive international response to climate change, and global transition to a low-carbon future. A fundamental national objective aims to achieve transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050.

The Climate Action and Low Carbon Development (Amendment) Act 2021 was adopted in 2021 and sets Ireland on a legally binding path to net-Zero emissions no later than 2050, and

to a 51% reduction in emissions by the end of this decade. The Act provides the framework for Ireland to meet its international and EU climate commitments and to become a leader in addressing climate change.

The Irish Government published its Climate Action Plan in 2021 which provides a detailed framework for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting Ireland on a path to reach net-zero emissions by no later than 2050, as committed to in the Programme for Government and set out in the Climate Act 2021. The Plan lists the actions needed to deliver on national climate targets and sets indicative ranges of emissions reductions for each sector of the economy. It will be updated annually, including in 2022, to ensure alignment with Ireland's legally binding economy-wide carbon budgets and sectoral ceilings.

Ireland's latest greenhouse gas (GHG) emissions 1990-2020 are provisional figures based on the SEAI's final energy balance released in September 2021 (EPA, 2021). In 2020, Ireland's GHG emissions were estimated to be 57.70 million tonnes carbon dioxide equivalent (Mt CO2eq), which is 3.6% lower (or 2.14 Mt CO2 eq) than emissions in 2019 (59.84 Mt CO2 eq). There was a decrease of 4.0% in emissions reported for 2019 compared to 2018. Emissions reductions have been recorded in six of the last ten years of inventory data (2010-2020). In 2020, national total emissions decreased by 3.6%, emissions in the stationary ETS sector decreased by 6.4% and emissions under the ESD (Effort Sharing Decision) decreased by 2.7%. In 2020, the energy industries, transport and agriculture sectors accounted for 70.1% of total GHG emissions. Agriculture is the single largest contributor to the overall emissions, at 37.1%. Transport, energy industries and the residential sector are the next largest contributors, at 17.9%, 15.0% and 12.3%, respectively (EPA, 2021).

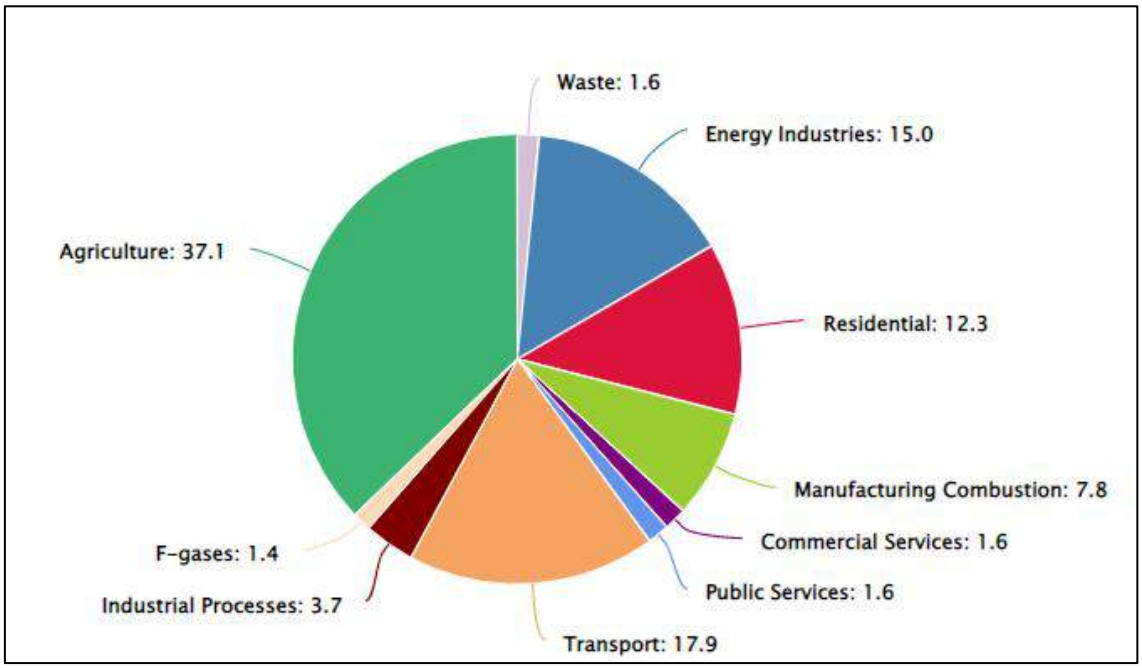

Figure 8-1: Ireland's Greenhouse Gas Emissions by Sector for 2020 (Source: EPA, 2021)

8.2 Study Methodology

Taking into account Ambient Air Quality Standards, the baseline air quality of the Site was examined using EPA monitoring data. Air quality impacts from the Proposed Development were then determined by a qualitative assessment of the nature and scale of dust generating activities associated with the construction phase of the Proposed Development in accordance with relevant guidance (Transport Infrastructure Ireland (TII) 2011 Appendix 8; Institute of Air Quality Management (IAQM) 2014).

Operational Phase traffic impact assessment involves air dispersion modelling using the UK Design Manual for Roads and Bridges Screening Model (DMRB, UK Highways Agency 2007) (Version 1.03c), the NO_x to NO_2 Conversion Spreadsheet (UK Department for Environment, Food and Rural Affairs, 2017), and following all relevant guidance (TII, 2011; HA, 2007; EPA; UK DEFRA; IAQM).

A desktop study involving various national and international documents on climate change and analysis of synoptic meteorological data from the nearest Met Eireann station was also carried out in order to compile this Chapter. Attention was focused on Ireland's obligations under the Kyoto Protocol and the Doha Amendment in the context of the overall climatic impact of the presence and absence of the Proposed Development.

8.3 The Existing and Receiving Environment (Baseline Situation)

The Site of the Proposed Development occupies an area of 11.2 hectares (Ha), with a developable site area of 10.8 Ha, at Wayside, Kilternan, Dublin 18. The Site is currently predominately greenfield and includes a 0.35 Ha derelict farmyard area.

The surrounding area is predominantly residential and agricultural. The Site is generally bounded by the Glenamuck Road to the north; hedgerows/trees and the Kilternan Country Market and the Sancta Maria property to the north-west; an existing stone wall and the recently constructed residential development named "Rockville" to the north-east; a1.2m high existing stone wall and the Enniskerry Road to the south-west; residential dwellings to the south; and open green field lands that will facilitate the future Glenamuck Link Distributor Road to the east. Part of the Site's frontage lies directly opposite Our Lady of the Wayside Church, Kilternan. The lands are located 1.9 km to the south-west of the M50 and Carrickmines Retail Park.

8.3.1 Air Quality

According to the 2012 Regulations (S.I. No. 326 of 2012), the proposed Site falls into 'Zone A' of Ireland which is described by the EPA as 'Dublin Conurbation'. It is expected that existing ambient air quality in the vicinity of the site is characteristic of a suburban location with the primary source of air emissions such as particulate matter, NO_2, and hydrocarbons likely to be of traffic, combustion and agriculture, and domestic fuel burning.

In conjunction with individual local authorities, the EPA undertakes ambient air quality monitoring at specific locations throughout the country in the urban and rural environment; an Air Quality Report based on data from 30 monitoring stations and a number of mobile air quality units is developed on an annual basis. The EPA's most recent publication 'Air Quality

in Ireland, 2020' reports the quality of the air in Ireland based on the data from the National Ambient Air Quality Monitoring Network throughout the year 2020.

When assessing air quality, the EPA focuses on two main pollutants: particulate matter and nitrogen oxides. Measured concentrations of NO_2 for the years 2019 and 2020 are presented in Table 8-2 for Zone A monitoring stations. These results show that current levels of NO_2 are well below the annual mean and 1-hour maximum limit values. In the year 2019, annual mean concentrations of NO_2 ranged from 15 - 49 ug/m^3 across all Zone A stations, with no exceedance of the maximum hourly limit (EPA, 2020). In the year 2020, annual mean concentrations of NO_2 ranged from 11 - 30 ug/m^3 across all Zone A stations, with no exceedance of the maximum hourly limit (EPA, 2021).

The Dun Laoghaire monitoring station is the closest station to the Site (ca. 6.7km) which continuously monitors for concentrations of nitrogen oxides (NO_2) and particulate matter ($PM_{2.5}$ and PM_{10}). Concentrations of NO_2 are also well below the threshold limits contained within the regulations at Dun Laoghaire monitoring station, with an annual mean of 15 ug/m^3 and 14 ug/m^3 measured in 2019 and 2020, respectively (EPA, 2020; EPA, 2021).

During 2020, the restriction of movement in Ireland due to the COVID-19 Pandemic had an impact on air quality nationally with a large-scale reduction in vehicular traffic. It is noted that the decrease in NO_2 levels during that year is a direct result of the restrictions placed on movements and construction due to COVID-19.

Based on the EPA monitoring data and taking account of the Site's environs and surrounding land-use, along with changes in vehicular and construction activity, a conservative estimate of current background NO_2 concentrations in the vicinity of the Site is 16ug/m^3.

Table 8-2: Concentrations of NO_2 at Zone A Monitoring Stations

Station	Objective	Concentration (µg/m^3)		Limit or Threshold Value (ug/m^3)	Number of values >200µg/m^3
		2019	2020		
Winetavern St	Annual Mean NO_2	28	15	40	N/A
	Hourly Max NO_2	142	121.5	200	0
Davitt Road	Annual Mean NO_2	24	14	40	N/A
	Hourly Max NO_2	127	108.3	200	0
DAA	Annual Mean NO_2	-	23	40	N/A
	Hourly Max NO_2	-	88.8	200	0
St. Johns Road	Annual Mean NO_2	43	30	40	N/A

Station	Objective	Concentration (µg/m^3)		Limit or Threshold Value (ug/m^3)	Number of values >200µg/m^3
		2019	2020		
	Hourly Max NO_2	156	130.1	200	0
Rathmines	Annual Mean NO_2	22	13	40	N/A
	Hourly Max NO_2	183	170	200	0
Dun Laoghaire	Annual Mean NO_2	15	14	40	N/A
	Hourly Max NO_2	104	92.1	200	0
Ballyfermot	Annual Mean NO_2	20	12	40	N/A
	Hourly Max NO_2	124	107.7	200	0
Blanchard-stown	Annual Mean NO_2	31	12	40	N/A
	Hourly Max NO_2	163	164.6	200	0
Swords	Annual Mean NO_2	15	11	40	N/A
	Hourly Max NO_2	108	83.7	200	0
Dublin Port	Annual Mean NO_2	-	23	40	N/A
	Hourly Max NO_2	-	117.3	200	0
Pearse St	Annual Mean NO_2	49	27	40	N/A
	Hourly Max NO_2	151	142.3	200	0
Tallaght	Annual Mean NO_2	-	14	40	N/A
	Hourly Max NO_2	-	100.8	200	0
Ringsend	Annual Mean NO_2	24	18	40	N/A
	Hourly Max NO_2	109	123.8	200	0

Measured concentrations of PM_{10} for the years 2019 and 2020 are presented in Table 8-3 for Zone A monitoring stations. As is evident from these results, current levels of PM_{10} are well below the annual mean limit value. In the year 2019, annual mean concentrations of PM_{10} ranged from 11 – 19 ug/m^3 across all Zone A stations, with no exceedance of short-term limit values (EPA, 2020). In the year 2020, annual mean concentrations of PM_{10} ranged from 10 –

20 ug/m^3 across all Zone A stations, with no exceedance of short-term limit values (EPA, 2021). Concentrations of PM_{10} at Dun Laoghaire monitoring station were also well below their respective limit values in 2019, with an annual mean of 12 ug/m^3 measured in 2019 and 2020 (EPA, 2020).

Table 8-3: Concentrations of PM_{10} at Zone A Monitoring Stations

Station	Objective	Concentration (µg/m^3)		Limit or Threshold Value
		2019	2020	
Winetavern St	Annual Mean PM_{10}	15	13	40 µg/m^3
	Days >50µg/m^3	9	0	35 days
Rathmines	Annual Mean PM_{10}	15	11	40 µg/m^3
	Days >50µg/m^3	9	2	35 days
Phoenix Park	Annual Mean PM_{10}	11	10	40 µg/m^3
	Days >50µg/m^3	2	0	35 days
Blanchard-stown	Annual Mean PM_{10}	19	15	40 µg/m^3
	Days >50µg/m^3	11	2	35 days
Dun Laoghaire	Annual Mean PM_{10}	12	12	40 µg/m^3
	Days >50µg/m^3	2	0	35 days
Ballyfermot	Annual Mean PM_{10}	14	12	40 µg/m^3
	Days >50µg/m^3	7	2	35 days
Tallaght	Annual Mean PM_{10}	12	10	40 µg/m^3
	Days >50µg/m^3	3	0	35 days
Ringsend	Annual Mean PM_{10}	19	17	40 µg/m^3
	Days >50µg/m^3	12	8	35 days
St. John's Road	Annual Mean PM_{10}	14	13	40 µg/m^3
	Days >50µg/m^3	5	0	35 days
St Annes Park	Annual Mean PM_{10}	12	11	40 µg/m^3
	Days >50µg/m^3	1	0	35 days
Dublin Airport	Annual Mean PM_{10}	-	13	40 µg/m^3
	Days >50µg/m^3	-	0	35 days
Davitt Road	Annual Mean PM_{10}	19	15	40 µg/m^3

Station	Objective	Concentration (µg/m^3)		Limit or Threshold Value
		2019	2020	
	Days >50µg/m^3	15	4	35 days
Dublin Port	Annual Mean PM_{10}	-	20	40 µg/m^3
	Days >50µg/m^3	-	7	35 days
Finglas	Annual Mean PM_{10}	13	12	40 µg/m^3
	Days >50µg/m^3	2	0	35 days
Marino	Annual Mean PM_{10}	14	13	40 µg/m^3
	Days >50µg/m^3	4	0	35 days

8.3.2 Macroclimate

Ireland has a typical maritime climate, largely due to its proximity to the Atlantic Ocean and the presence of the Gulf Stream. Due to the moderating effects of the Gulf Stream, Ireland does not suffer the temperature extremes that are experienced by many other countries at a similar latitude. Mean annual temperatures generally range between 9^{o}C and 10^{o}C. Winters tend to be cool and windy while summers are mostly mild and less windy. The prevailing wind direction is between the south and west with average annual wind speeds ranging between 6 knots in parts of south Leinster to over 15 knots in the extreme north. Rainfall in Ireland occurs throughout the year with reasonable frequency. The highest rainfall occurs in the western half of the country and on high ground, and generally decreases towards the northeast. As the prevailing winds are from the west-southwest, the west of Ireland experiences the largest number of wet days. The area of least precipitation is along the eastern seaboard of the country.

8.3.3 Microclimate

The synoptic meteorological station at Dublin Airport is located approximately 3km northeast of the Proposed Development; and for the purposes of this Chapter, weather data collected here may be considered similar to that which is experienced in the area of the Proposed Development site.

The weather in the area of the Proposed Development site is generally dominated by cool oceanic air masses, with cool winters, mild humid summers, and a lack of temperature extremes. Based on meteorological data at Dublin Airport over the last 3 years, the mean January temperature is 5.3^{o}C, while the mean July temperature is 15.4^{o}C. The prevailing wind direction is from a quadrant centred on the southwest. These are moderately warm winds from the Atlantic and they habitually bring rain. The expected annual rainfall for the eastern half of the country ranges between 750 and 1000mm. Easterly winds are less frequent, weaker, and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.

8.3.3.1 Rainfall

Rainfall is a key indicator of changes in climate, as measurements of rainfall are fundamental to assessing the effects of climate change on the water cycle and water balance. Table 8-4 illustrates the monthly and annual rainfall data collected over a 3-year period (2018-2021) at Dublin Airport Weather Station. The annual rates of precipitation ranged from 709.4mm in 2018 to 886.1mm in 2019 with distribution of the highest monthly rainfall values falling mainly in the autumn and winter months. This is broadly within the expected range of the eastern half of the country.

Table 8-4: Monthly Rainfall Values (mm) for Dublin Airport Weather Station from January 2018 to December 2021 (Source: Met Eireann)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	115.1	55.0	32.1	10.8	83.5	12.6	72.9	65.3	42.0	79.8	11.7	85.8	**666.6**
2020	111.5	130.4	31.8	12.8	9.3	69.6	98.9	87.3	60.9	80.6	48.1	83.1	**748.8**
2019	26.8	30.5	92.5	74.6	33.4	82.9	41.0	91.9	104.6	77.2	173.0	57.7	**886.1**
2018	93.1	36.9	100.0	68.9	19.1	4.8	40.0	48.0	43.8	42.6	131.2	81.0	**709.4**
LTA[13]	62.6	48.8	52.6	54.1	59.5	66.7	56.2	73.3	59.5	79.0	72.9	72.7	**757.9**

8.3.3.2 Wind

Wind at a particular location can be influenced by a number of factors, such as obstructions by trees or buildings, the nature of the terrain, and deflection by nearby mountains or hills. Wind blows most frequently from the south and west for open sites while winds from the northeast and north occur less often. The analysis of hourly weather data from Dublin Airport synoptic weather station over a period of 5 years suggests that the predominant wind direction blows from the southwest, with windspeeds of between 7 and 10 knots occurring most frequently.

Figure 8-2 provides a wind speed frequency distribution which represents wind speed classes and the frequency at which they occur (% of time) at Dublin Airport weather station over a period of 5 years. Wind speeds of 8 knots have the highest frequency, occurring approximately 8.6% of the time.

[13] The 'LTA' is average for the climatological long-term-average (LTA) reference period 1981-2010

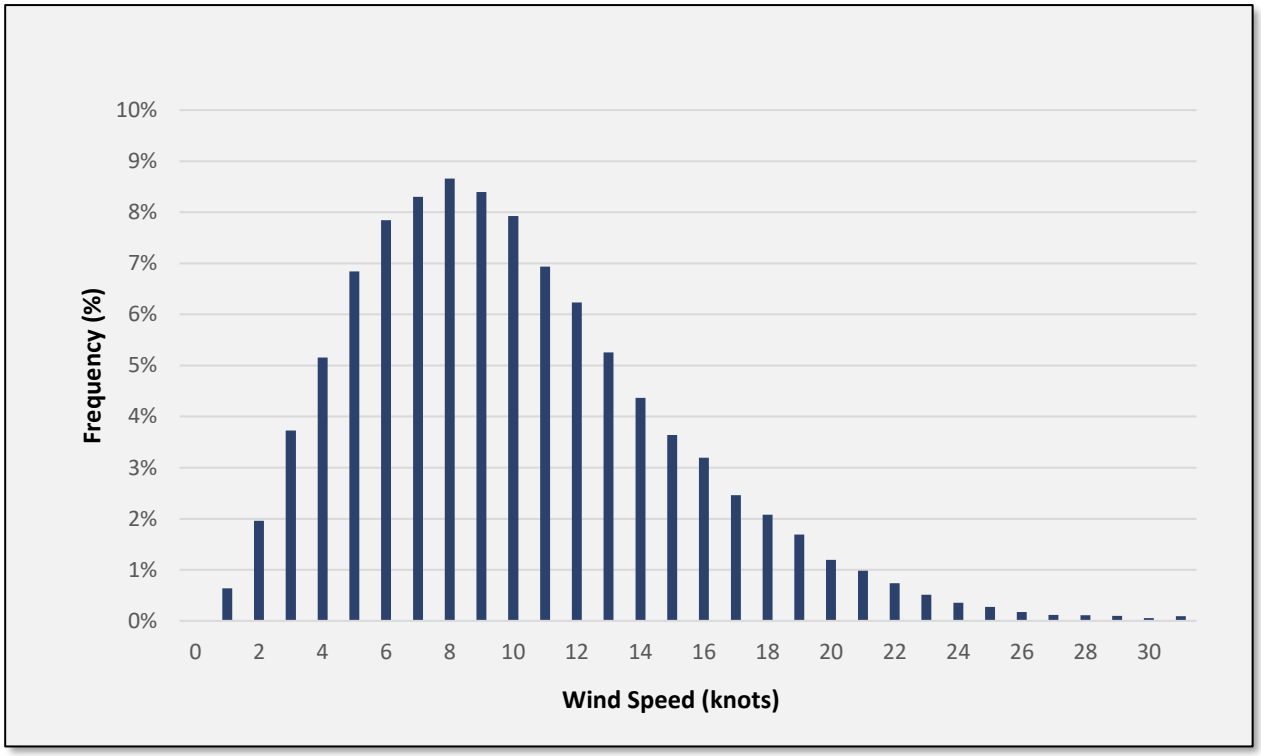

Figure 8-2: Wind Speed Frequency Distribution at Dublin Airport Synoptic Weather Station over 5 years (2016-2020)

Figure 8-3 provides a wind rose of the predominant wind directions and associated wind speeds at Dublin Airport. As is visible from Figure 8-3, the prevailing wind is from a south-westerly direction with an annual incidence of 33% for winds between 200 and 250 degrees. The most frequent wind speed associated with this wind direction is between 11 and 16 knots which is considered a 'moderate breeze' in terms of the Beaufort scale, this wind direction and wind speed occurs in combination approximately 11.39% of the time. The overall most common windspeed is between 7 and 10 knots, occurring in 33.28% of incidences, and wind speeds of between 11 and 16 knots occurring in 29.63% of incidences.

The lowest frequency is for winds blowing from the northern quadrant at approximately 2.81% of the time. The incidence of wind between 1 and 6 knots is about 26.16% of the year with wind speeds of above 17 knots (8.7 m/s) occurring in just 10.92% of incidences. The influence of topography can be seen in the low frequency of winds from a southerly direction at Dublin Airport, which occur at 4.24% of the year; this is due to the sheltering effect of the mountains to the south. This windrose is broadly representative of the prevailing conditions experienced at the Proposed Development site.

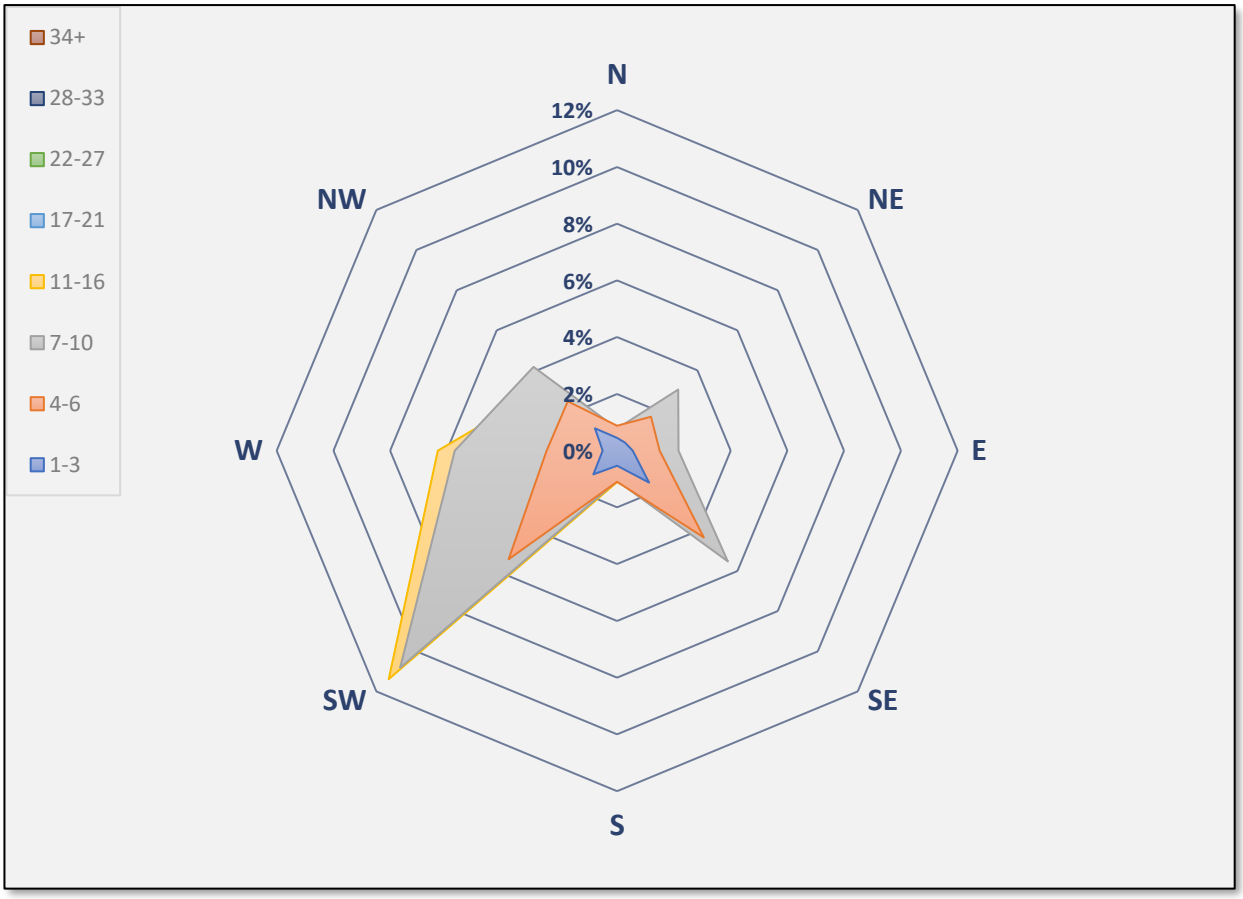

Figure 8-3: 5-year Windrose at Dublin Airport Synoptic Weather Station 2016-2020 (Developed using Met Eireann Hourly Data)

8.4 Characteristics of the Proposed Development

The Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

8.5 Potential Impact of the Proposed Development

8.5.1 Potential Impacts on Air Quality

8.5.1.1 Construction Phase

The construction works include ground preparation works, development of site infrastructure, construction of buildings and hardstanding areas and landscaping of the site including open soft landscaped areas.

There is potential for construction related air emissions to impact on local air quality as a result of the Proposed Development. Potential impacts are expected to be short-term and of a temporary nature. The main air quality impacts that may arise during construction activities are:

- Dust deposition;
- Elevated particulate matter concentrations (PM_{10} and $PM_{2.5}$) as a result of dust generating activities on site; and
- An increase in concentrations of airborne particles, volatile organic compounds, nitrogen oxides, and sulphur oxides due to exhaust emissions from diesel powered vehicles and equipment on site (non-road mobile machinery) and vehicles accessing the site.

The greatest potential impact on air quality during this phase is from construction dust emissions and the potential for nuisance dust. The dust emissions from a construction site that may result in air quality impacts generally depend on:

- Site activities and duration;
- The size of the site;
- The meteorological conditions;
- The proximity of receptors to the activities;
- The adequacy of applied mitigation measures; and
- The sensitivity of receptors to dust.

The primary sources of dust identified include soil excavation works, demolition, bulk material transportation, loading and unloading, stockpiling materials, cutting and filling, and vehicular movements (HGVs and on-site machinery).

According to Transport Infrastructure Ireland guidelines (TII, 2011), it is difficult to accurately quantify dust emissions arising from construction activities. Therefore, it is not possible to easily predict changes to dust soiling rates or PM_{10} concentrations. TII recommend a semi-quantitative approach to determine the likelihood of significant impact in this instance. This should also be combined with an assessment of the proposed mitigation measures. Table 8-5 outlines the distance criteria which is recommended for use in assisting a semi-quantitative assessment:

Table 8-5: Assessment Criteria for the Impact of Dust Emissions from Construction Activities, with Standard Mitigation in Place

Source		**Potential Distance for Significant Effects (Distance from source)**		
Scale	Description	Soiling	PM10	Vegetation effects
Major	Large construction sites, with high use of haul routes	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul routes	50m	15m	15m
Minor	Minor construction sites, with limited use of haul routes	25m	10m	10m

In order to account for a worst-case scenario, the Proposed Development can be considered moderate in scale due to the size of the Site and the duration of construction activities. Therefore, it can be assumed that there is potential for significant dust soiling 50m from the Site.

There are a number of high-sensitivity receptors (residential dwellings) located within 50m of the Site boundary; these are mainly situated to the west of the Proposed Development Site. There are also a small number of residential dwellings located to the north, northeast and south of the Proposed Development Site. Therefore, in the absence of mitigation, it is considered that there is potential for dust impacts to occur at these locations.Sensitive receptors within 100m of the Proposed Development are identified in Table 8-6:

Table 8-6: Sensitive Receptors

Name	Type	Coordinates		Orientation Relative to Site Boundary
		X	Y	
Ballycorus Road	Residential	53.235967	-6.191168	South
Rockville	Residential	53.240095	-6.193351	Northeast
Wayside Cottages	Residential	53.238202	-6.196026	West
Enniskerry Road	Residential	53.237229	-6.195346	West
Glenamuck Road	Residential	53.240118	-6.194902	North

According to IAQM Guidance (2016), the primary factor influencing the Pathway is the distance between the sensitive receptor and the dust sources. However, other factors can cause a higher or a lower category to be assigned then would be the case based on distance alone. These factors include:

- Orientation of receptors relative to the prevailing wind direction; and
- Topography, terrain and physical features.

Meteorological conditions greatly affect the level of dust emissions and subsequent deposition downwind of the source; the most predominant being rainfall and wind speed. Adverse impacts can occur in any direction from a site; however, they are more likely to occur downwind of the prevailing wind direction and/or close to the site. Relatively high levels of moisture in the surrounding air, soils, and precipitation helps to suppress dust due to the cohesive properties of water between dust particles. The least favourable meteorological conditions for dust generation would typically be warm days with strong winds and low precipitation. Due to the variability of weather, it is impossible to predict the conditions that will occur during the Construction Phase of the development. However, wind direction is most likely to prevail from the southwest.

Table 8-7 outlines the hourly percentage distribution of wind speed and direction at Dublin Airport synoptic weather station over a 5-year period (2016-2020). This data is consistent with Figure 8-3 of this Chapter and shows that the most frequent wind direction prevails from the southwest (33.89% frequency). The corresponding most frequent wind speed is between 7 and 10 knots which is considered a ‘gentle breeze’ in terms of the Beaufort scale; this wind direction and wind speed occurs in combination approximately 12.28% of the time.

Table 8-7: Percentage Distribution of Wind Speeds and Direction at Dublin Airport (2016-2020)

Wind speed (Knots)		<1	1 - 3	4 - 6	7 - 10	11-16	17-21	22-27	28-33	34+	% Dry Days
Wind Direction	Degrees										
North	350 - 10	0.03	0.54	0.91	0.61	0.61	0.11	0.01	0.00	0.00	40%
North-east	20 - 70		0.54	2.15	3.89	2.78	0.98	0.05	0.00	0.00	
East	80 - 100		0.94	1.92	2.22	1.2	0.23	0.00	0.00	0.00	
South-east	110 - 150		1.48	3.01	4.87	2.31	0.54	0.06	0.00	0.00	
South	170 - 190		0.64	0.98	1.35	1.33	0.36	0.07	0.00	0.00	
South-west	200 - 250		0.98	5.89	12.28	12.14	2.29	0.32	0.00	0.00	
West	260 - 280		0.59	2.69	5.57	5.73	1.79	0.3	0.00	0.00	
North-west	290 - 340		1.13	2.37	4.38	3.61	1.09	0.15	0.00	0.00	

Dry days with moderate to high windspeeds (above 5m/s (7-10 knots)) are the conditions which are most likely to result in fugitive dust emissions. Sensitive receptors within 50m of the Proposed Development have been identified as a series of residential dwellings which are located to the west, north, northeast and south of the site.

Receptors located to the west of the site would require prevailing winds from the east to be potentially impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is 1.5%. Receptors located to the north of the Site would require prevailing winds from the south to potentially be impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is 1.2%. Receptors located to the northeast of the Site would require prevailing winds from the southwest to potentially be impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is 10.8%. Receptors located to the south of the Site would require prevailing winds from the north to potentially be impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is 0.5%. Therefore, appropriate conditions for fugitive dust emissions at these receptors are highly infrequent and it is expected that adequate mitigation measures, as outlined in Section 8.6.1, will prevent nuisance dust from resulting in any adverse impacts. Furthermore, the trees and hedgerows which are currently present on the boundary of the Proposed Development will act as a natural buffer for dust deposition in some cases.

Receptors located to the northeast of the site would require prevailing winds from the southwest to be potentially impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is

10.8%. Therefore, in the absence of mitigation, it is considered that there is potential for dust impacts to occur at these locations.

Appropriate mitigation and monitoring measures have been recommended and will be implemented at the Site in order to minimise the risk of dust emissions arising during construction and demolition. These mitigation measures have been outlined in the Construction Environmental Management Plan (CEMP) for the site, and provided such measures are adhered to, it is not considered that significant air quality impacts will occur.

Construction vehicles and machinery during the Construction Phase will temporarily and intermittently generate exhaust fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and particulate matter (dust). Dust emissions associated with vehicular movements are largely due to the resuspension of particulate materials from ground disturbance. According to the IAQM (2014), experience from the assessment of exhaust emissions from on-site machinery and Site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. Air pollutants may increase marginally due to construction-related traffic and machinery from the Proposed Development. However, any such increase is not considered significant and will be well within relevant ambient air quality standards. According to TII (2011), the significance of impacts due to vehicle emissions during the Construction Phase will be dependent on the number of additional vehicle movements, the proportion of HGVs and the proximity of sensitive receptors to Site access routes. If construction traffic would lead to a significant change (> 10%) in Annual Average Daily Traffic (AADT) flows near to sensitive receptors, then concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ should be predicted in line with the methodology as outlined within TII guidance. Construction traffic is not expected to result in a significant change (> 10%) in AADT flows near to sensitive receptors. Therefore, a detailed air quality assessment is not required.

8.5.1.2 Operational Phase

The greatest potential effect on air quality during the Operational Phase of the Proposed Development is from traffic-related air emissions.

Operational traffic will use regional and local roads to access the facility with potential increases of traffic flow on some roads and subsequent associated emissions of VOCs, nitrogen oxides, sulphur dioxides and increased particulate matter concentrations.

In terms of associated impacts on air quality, Table 8-8 outlines the criteria that are prerequisite for an air quality assessment. According to IAQM guidance (2017), if none of the criteria are met, then there should be no requirement to carry out an air quality assessment for the impact of the development on the local area, and the impacts can be considered as having an insignificant effect.

Table 8-8: Indicative Criteria for Requiring an Air Quality Assessment (Source: IAQM, 2017)

Potential Change resulting from Proposed Development	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors	A change of LDV flows of more than 1000 Annual Average Daily Traffic (AADT)
Cause a significant change in Heavy Duty Vehicle (HGV) flows on local roads with relevant receptors	A change of HGV flows of more than 100 Annual Average Daily Traffic (AADT)
Realign roads, i.e., changing the proximity of receptors to traffic lanes	Where the change is 5m or more
Cause a change in Daily Average Speed (DAS)	Where the DAS will change by 10 km/h or more
Cause a change in peak hour speed	Where the peak hour speed will change by 20km/h or more.

As per the Traffic and Transport Assessment which has been detailed in Chapter 12, Section 12.1, the criteria presented in Table 8-8 have not been met by the Proposed Development; it is therefore considered unlikely for significant air quality impacts to occur as a result of increased traffic flow, and an associated air quality assessment is not required.

8.5.2 Potential Impacts on Climate

8.5.2.1 Construction Phase

There is the potential for combustion emissions from onsite machinery and traffic derived pollutants of CO_2 and N_2O to be emitted during the construction phase of the development. However, due to the size and duration of the construction phase, and the mitigation measures proposed, the effect on national GHG emissions will be insignificant in terms of Ireland's obligations under the Kyoto Protocol and therefore will have no considerable impact on climate. Overall, climatic impacts are considered to be short-term and imperceptible.

8.5.2.2 Operational Phase

8.5.2.2.1 Energy Statement

Waterman Moylan Consulting Engineers Limited have been commissioned by the Applicant, Liscove Limited, to provide an Energy Statement for the Proposed Development.

This report identifies the energy standards with which the Proposed Development will have to comply and also sets out the overall strategy that will be adopted to achieve these energy efficiency targets. The dwellings will be required to minimise overall energy use and to incorporate an adequate proportion of renewable energy in accordance with Building Regulations Part L 2019, Conservation of Energy & Fuel.

The proposed approach to achieving Part L Compliance will be based on a combination of the following solutions once a detailed analysis has been completed at detailed design stage. A

final decision will be made once capital costs, renewable targets and regulation compliance have all been compared to find the most appropriate solution.

- Meeting minimum U-Value standards;
- Achieve air tightness standards of3m3/m2/hr or lower;
- Comply with all Acceptable Construction Details (ACDs) or thermally model all thermal bridging details to achieve thermal bridging factors of less than 0.08W/m2K;
- Install high efficiency heat pumps and time and temperature zone control in all houses and apartments;
- Install centralised mechanical ventilation systems (either MEV or HRV) to ensure adequate ventilation rates are achieved in the houses and apartments which maximising the benefits of the airtight construction.

The full Energy Statement can be found in Appendix B of this EIAR.

8.5.2.2.2 Flood Risk

There is growing scientific consensus that the warming of the climate is expected to increase the risk of floods. Rising sea levels and more frequent and severe coastal storms will increase the risk of coastal and estuarial flooding as well as coastal erosion. According to the Planning System and Flood Risk Management document (DECLG & OPW, 2009), where the floodplain or coastal plain is well defined, climate change is expected to change the probability of flooding and the depth for a particular event with little change in spatial extent. Only where extensive areas of land rise gently from the river or the sea is climate change expected to significantly increase the area affected by flooding.

There is a great deal of uncertainty in relation to the potential effects of climate change; therefore, a precautionary approach should be adopted, where necessary, to reflect uncertainties in flooding datasets and the ability to predict the future climate. Development should be designed with careful consideration to possible future changes in flood risk, including the effects of climate change so that future occupants are not subject to unacceptable risk (OPW, 2009).

A Site Specific Flood Risk Assessment (SSFRA) was undertaken by Roger Mullarkey & Associates (May 2022) on behalf of Liscove Limited for the Proposed Development. This assessment identifies the risk of flooding at the Site from various sources and sets out possible mitigation measures against the potential risks of flooding. Sources of possible flooding include coastal, fluvial, pluvial (direct heavy rain), groundwater and human/mechanical errors. This report provides an assessment of the Proposed Development site for flood risk purposes only.

The Proposed Development site have been analysed for risks from tidal flooding from the Irish Sea at Balscadden Bay, fluvial flooding from the Bloody Stream, pluvial flooding, ground water and failures of mechanical systems. Table 8-9 presents the various residual flood risks involved:

Table 8-9: Residual Flood Risks (Source: Flood Risk Assessment)

Source	Pathway	Receptor	Likeli-hood	Conse-quence	Risk
Tidal	>5.5km from the coast and elevated >142m above sea level	People/prop-erty	Remote	N/A	Very low
Fluvial	Overtopping of drainage channel on Gelnamuck Road	People/prop-erty	Remote	N/A	Low
Pluvial	Flooding from drain-age systems	People/prop-erty	Possible	Low	Low
Ground Water	Rising water table	People/prop-erty	Possible	Low	Low
Human/ Mechani-cal Error	Blockage of drainage	People/prop-erty	Possible	Moderate	Low

As indicated in Table 8-9, the various sources of flooding have been reviewed, and the risk of flooding from each source has been assessed. Where necessary, mitigation measures have been proposed. The assessment concluded that the Site is suitable for development and has an overall low risk of being affected by flooding. The full FRA Report can be found in Appendix C of this EIAR.

8.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as "*impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*". Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

All planning applications which have been granted permission and are already developed have been incorporated into the baseline assessment of this application. A planning search has revealed that there have been a number of planning applications in the vicinity of the Proposed Development Site which have been granted permission that could potentially be constructed at the same time as the Proposed Development. These include planning permissions for residential or other small-scale developments such as extensions to existing dwellings, construction of new car parking spaces, etc. in the immediate vicinity of the Proposed Development site, as well as larger scale developments in close proximity to the Proposed Development site.

The cumulative effects on the air quality and climate of the current Proposed Development and other permitted or existing developments have been considered, in particular through the generation of air pollutants and GHG emissions. The potential impacts on air quality and

climate are assessed in Section 8.5 and it is considered that there are no other potential significant cumulative impacts associated with the Proposed Development and offsite permitted developments.

In terms of dust, no significant impacts are predicted; good construction practice, which incorporates the implementation of the identified mitigation measures, will be employed at the Proposed Development site. Due to the implementation of good construction practices at the Site of the Proposed Development and these offsite permitted developments, it is not anticipated that significant cumulative impacts will occur.

Operational stage impacts involved traffic data which is inclusive of traffic associated with other existing and permitted developments in the vicinity of the Site. Therefore, cumulative impacts have been assessed in this regard and the impact has been determined as negligible.

8.5.4 'Do Nothing" Impact

The Do-Nothing impact has been considered in terms of air quality in this Chapter. If the Proposed Development did not proceed, the Proposed Development Site as former playing fields and agricultural lands (grazing of cattle) over an area of 10.8 Ha. The existing ambient air quality would remain unchanged onsite and at nearby sensitive receptors.

Greenhouse gas emissions as a result of the Proposed Development are also likely to be marginal in terms of overall national GHG emission estimates and Ireland's obligations under the Kyoto Protocol and the Paris Agreement when compared to a Do-Nothing scenario.

8.6 Avoidance, Remedial & Mitigation Measures

8.6.1 Air Quality

8.6.1.1 Construction Phase

It is not expected that adverse air quality impacts are likely to occur at sensitive receptors as a result of the Proposed Development. However, appropriate mitigation measures, as outlined within the Construction and Environmental Management Plan (CEMP), which has been prepared by Enviroguide Consulting, will be employed as necessary to further prevent such impacts occurring:

- Vehicle and wheel washing facilities will be provided at site exit where practicable. If necessary, vehicles are to be washed down before exiting the site.
- Netting will be provided to enclose scaffolding to mitigate escape of air borne dust from the existing buildings.
- Engines and exhaust systems will be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
- Piling machinery will be shrouded when operating near to boundaries.
- Dust emission over the site boundary will be minimised using static sprinklers or other watering methods as necessary.
- No burning of materials will be permitted on site.
- Water sprays for dust suppression will be affixed to mechanical excavators/munchers involved in demolition works.

- Demolition waste will be removed from site as quickly as possible to minimise risk of dust generation and any fine material will be covered with a tarpaulin or similar material and tied down.
- Water sprays and cannons will be used where possible during cutting, with protective measures applied to retained finishes local to the cutting.
- Prior to commencement, the Main Contractor will identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions.
- In areas of poor natural ventilation, dust capture/extraction methods will be employed by the Main Contractor.
- The Main Contractor will allocate suitably qualified and experienced personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
- The Main Contractor will be required to appoint a senior member of its site management team to act as the liaison with third parties in respect of complaints regarding dust and or site activities.
- Monitoring of dust deposition will be undertaken at nominated boundary locations to ensure that dust levels comply with the TA Lift limit value of 350mg/(m²/day) based on a 30-day average using Bergerhoff gauges (Limits to be agreed with local authority).

8.6.1.2 Operational Phase

It has been determined that the Operational Phase air quality impact is negligible and therefore no Site-specific mitigation measures are proposed.

8.6.2 Climate

As negative climatic impacts associated with the Construction and Operational Phases of the Proposed Development are negligible, no mitigation measures are proposed. Best practice measures will be implemented to minimise exhaust emissions from construction and operational vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods. Furthermore, all proposals for development will seek to achieve the greatest standards of sustainable construction and design and will have regard to sustainable building design criteria.

8.6.3 "Worst Case" Scenario

Worst case scenario would involve failures of mitigation measures for the Proposed Development. In such events, it is not considered that dust nuisances will occur.

8.7 Residual Impacts

Residual Impacts are defined *as 'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

The Proposed Development is likely to result in a long-term increase in traffic on the roads surrounding the Proposed Development Site; however, this increase in traffic has been determined to have negligible impacts in terms of local air quality. Furthermore, the increase in traffic has been determined as marginal with regard to climatic impacts. Therefore, no

adverse residual impacts are anticipated from the proposed scheme in the context of air quality and climate.

8.8 Monitoring

The monitoring of construction dust during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the Site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at strategic locations along the Site boundaries for a period of 30 +/- 2 days. The selection of sampling point locations will be carried out in consideration of the requirements of *VDI 2119* with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the Gauges will be removed from the Site; the dust deposits in each Gauge will then be determined gravimetrically and expressed as a dust deposition rate in mg/m^2/day in accordance with the relevant standard.

Due to the negligible impact on air quality and climate from the Operational Phase of the Proposed Development, no specific monitoring is recommended.

8.9 Interactions

Interactions between Air Quality and Climate and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

8.9.1 Population and Human Health

Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as negligible, therefore air quality impacts from the Proposed Development are not expected to have a significant impact on population and human health.

8.9.2 Biodiversity

Interactions between Air Quality and Biodiversity have been considered as the Construction Phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the construction works. However, the mitigation measures employed at the Proposed Development will ensure that the impacts to flora and fauna are not significant.

8.9.3 Land and Soil

The excavation of soils across the Proposed Development site and the temporary stockpiling of soils has the potential to generate nuisance impacts (i.e., dust). However, the mitigation measures employed at the Proposed Development will ensure that the impacts are not significant.

8.9.4 Traffic

There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate is insignificant.

8.10 Difficulties Encountered When Compiling

No difficulties have been encountered while compiling this Chapter.

8.11 References

Air Pollution Act 2012 (S.I. No. 326 of 2012) Irish Statute Book.

Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) Irish Statute Book.

Air Quality, Clean Air for Europe Directive (2008/50/EC) EUR-Lex.

Dublin Airport Authority (2021) Dublin Airport Air Quality Monitoring Annual Report 2020.

Department of Communications, Climate Action and Environment (DCCAE) (2017) National Mitigation Plan

Department of Communications, Climate Action and Environment (DCCAE) (2018) National Adaptation Framework

Department of the Environment, Transport and the Regions, 1995. The Environmental Effects of Dust from Surface Mineral Workings- Volume 2. Technical Report.

Environmental Protection Agency (2018) Ireland's Final Greenhouse Gas Emissions 1990-2016.

Environmental Protection Agency (2019) Ireland's Final Greenhouse Gas Emissions 1990-2017.

Environmental Protection Agency (2019) Irelands National Inventory Report: Greenhouse Gas Emissions 1990-2017.

Environmental Protection Agency (2019) Irelands Provisional Greenhouse Gas Emissions 1990-2018.

Environmental Protection Agency (2020) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4).

Environmental Protection Agency (2020) Air Quality in Ireland 2019 Annual Report on Air Quality in Ireland from the Environmental Protection Agency.

European Commission (2007) 2020 Climate & Energy Package.

European Commission (2011) A Roadmap for Moving to a Competitive Low Carbon Economy in 2050.

European Commission (2014) 2030 Climate & Energy Framework.

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft.

Government of Ireland (2015) Climate Action and Low Carbon Development Act.

Government of Ireland (2019) Climate Action Plan 2019.

Institute of Air Quality Management (2014) Guidance on the Assessment of Dust from Demolition and Construction.

Institute of Air Quality Management (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning.

Institute of Air Quality Management (2017) Land-Use Planning & Development Control: Planning for Air Quality.

Intergovernmental Panel on Climate Change (2006) IPCC Guidelines for National Greenhouse Gas Inventories.

Intergovernmental Panel on Climate Change (2019) Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Met Eireann (2021) Daily Meteorological Data for Dublin Airport Synoptic Weather Station.

Met Eireann (2021) Hourly Meteorological Data for Dublin Airport Synoptic Weather Station.

Met Eireann (2021) Monthly Meteorological Data for Dublin Airport Synoptic Weather Station.

Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes.

UK Department for Environment, Food and Rural Affairs (2020) NO_x to NO_2 Conversion Spreadsheet (Version 8.1).

UK Department for Environment, Food and Rural Affairs (2008) Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedances of the 1-hour mean AQS Objective.

UK Highways Agency (2019) UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air Quality.

United Nations Framework Convention on Climate Change (1998) Kyoto Protocol to the UNFCCC.

United Nations Framework Convention on Climate Change (2012) The Doha Amendment to the Kyoto Protocol.

United Nations Framework Convention on Climate Change (2015) The Paris Agreement.

9 NOISE & VIBRATION

9.1 Introduction

This Chapter of the EIAR provides a description and assessment of the likely impact of the Proposed Development located at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18 regarding noise and vibration. The Chapter was prepared by Laura Griffin (BA Hons, MSc), Environmental Consultant, Enviroguide Consulting, Laura has experience working on a number of EIARs and EIA Screening Reports for projects of a similar scale to the Proposed Development.

This Chapter discusses the existing ambient noise levels at nearby sensitive receptors, the potential impacts of the Proposed Development on the existing ambient noise environment and the mitigation measures that may be employed to reduce or eliminate any potential impact.

9.2 Study Methodology

This assessment examines the likely impacts of sound pressure levels generated by the Proposed Development located at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18. Noise calculations will be used to predict and assess the likely impact of onsite equipment at offsite noise sensitive receptors.

For the purpose of the assessment, ‘sensitive receptors’ terminology used describes any persons, locations or otherwise that may be susceptible to changes as a consequence of the Proposed Development.

The primary noise impacts associated with this Proposed Development are likely to be due to:

- Extraction works, including site clearing and earthworks required to prepare the site for building foundations and installing utility services, this also includes the demolition of the dwelling/outbuildings on site;
- Development construction works;
- Trucks entering and exiting the facility.

With respect to the listed noise impacts, the key objective of the Proposed Development is to manage activities to ensure any significant increase in noise emissions are minimised.

Documents consulted during the preparation of this EIAR Chapter are listed in the References section. The acoustics section has been compiled taking cognisance of:

- Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011);
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise;
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures

- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels;
- ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere;
- ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation;
- Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities; and
- Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004.

The following noise indices, analysis and observations were reviewed.

- LA_{eq} - The A-weighted, equivalent continuous sound level of the measurement period. Represents an 'energy average' of the sound pressure levels measured.
- LA_{90} – The A-weighted, noise level exceeded for 90% of the measurement period. Calculated by statistical analysis of the measurement data.
- LA_{10} - The A-weighted, noise level exceeded for 10% of the measurement period. Calculated by statistical analysis of the measurement data.

9.2.1 Desktop Study

A desktop study was carried out to collate and review available information relating to the site and its environs for the completion of this noise assesment. The desktop study relied on the following:

- An evaluation of the Site and the surrounding area to assess certain changes to noise that are likely to impact the surrounding environs.

Identification of sensitive receptors for a complete list of the sensitive receptors identified as part of this assessment, see Section 9.5.1.

- BS 5228 2009 +A1 2014 Code of practice for noise and vibration control on construction and open sites with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from Part one of the standard Noise.

9.3 The Existing and Receiving Environment (Baseline Situation)

The Site of the Proposed Development occupies an area of 11.2 hectares (Ha), with a developable site area of 10.8 Ha, at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18 which include a derelict dwelling known as 'Rockville' and associated derelict outbuildings.

The surrounding area is predominantly residential and agricultural. The Site is generally bounded by the Glenamuck Road to the north; hedgerows/trees and the Kilternan Country Market and the Sancta Maria property to the north-west; an existing stone wall and the recently constructed residential development named "Rockville" to the north-east; a1.2m high existing stone wall and the Enniskerry Road to the south-west; dwellings to the south; and open green

field lands that will facilitate the future Glenamuck Link Distributor Road to the east. Part of the Site's frontage lies directly opposite Our Lady of the Wayside Church, Kilternan. The lands are located 1.9 km to the south-west of the M50 and Carrickmines Retail Park.

RSK Ireland Limited (RSK) conducted a noise impact assessment on behalf of Liscove Limited in respect of the Proposed Development. The assessment considered the potential impact of the existing and future noise sources on the future residents of the proposed dwellings, along with an assessment of the potential operational phase noise impact of the Proposed Development to nearby receptors.

The baseline noise environment at the Proposed Development site has been determined through noise surveys between 13th and 14th May 2022. The noise surveys were conducted in accordance with ISO 1996-2:2017 "Acoustics -- Description, measurement and assessment of environmental noise -- Part 2: Determination of sound pressure levels".

9.3.1 Monitoring Location

Unattended noise measurements were conducted at Location N1. Attended noise measurements were conducted at locations N2 – N4. The approximate noise measurement location is shown in Figure 9-1.

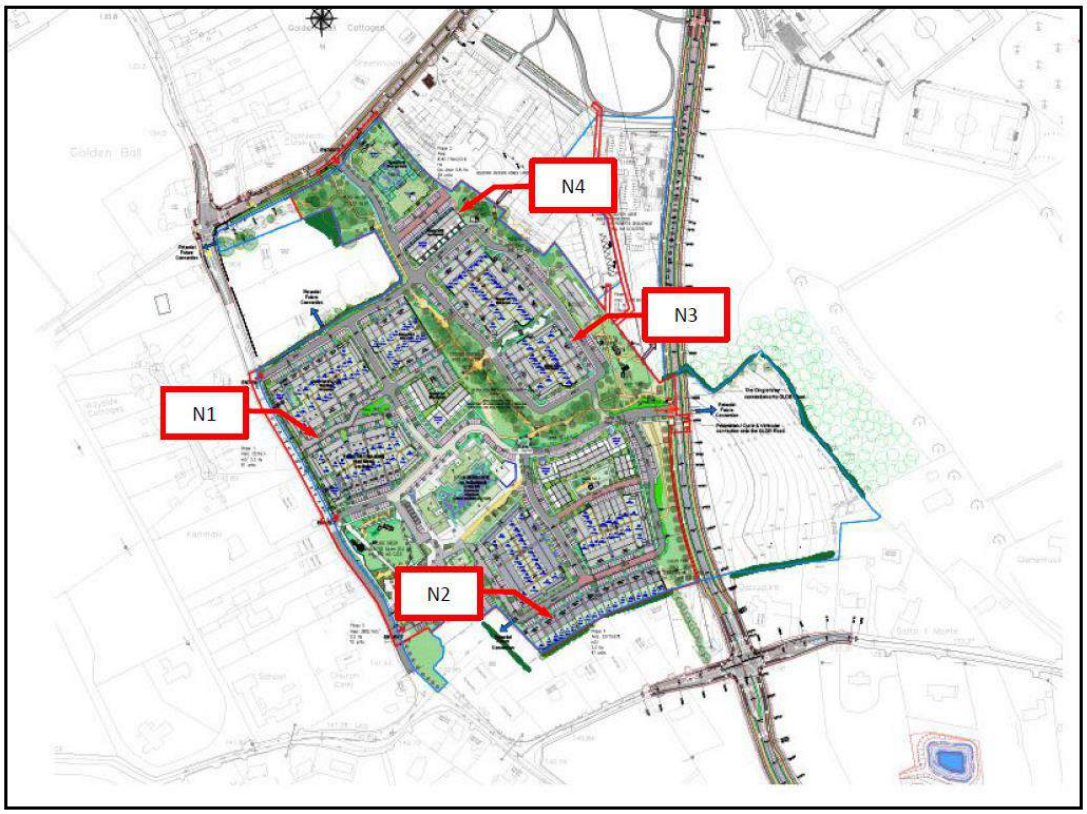

Figure 9-1: Proposed Site Plan Showing Baseline Monitoring Position

9.3.2 Measurement Parameters

The noise survey results are presented in decibels (dB), using the following parameters:

LAeq,T is the equivalent continuous sound level and is used to describe a fluctuating sound as a single value over the sample period (T).

LAFmax,T The maximum A-weighted sound pressure level occurring within a specified time period (T). Measured using the “Fast” time weighting.

LAF10,T Refers to those A-weighted noise levels in the top 10 percentile of the sampling interval; it is the level which is exceeded for 10% of the measurement period (T).It is used to determine the intermittent high noise level features of locally generated noise and usually gives an indicator of the level of road traffic. Measured using the “Fast” time weighting.

LAF90,T Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval (T). It is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to describe a background level without contribution from intermittent sources.

All sound levels in this report are expressed in terms of decibels (dB) relative to 2x10-5 Pa, Noise measurements use a reference time period (T) of 15-minutes.

9.3.3 Measurement Results

9.3.3.1 Location N1

Table 9-1 summarises the measured daytime (i.e., 07:00 to 23:00) noise levels at Location N1.

Table 9-1: Measured Daytime Noise Levels at Location N1

Period	Date	Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)				Notes
			L_{AEQ}	L_{AMAX}	L_{A10}	L_{A90}	
Daytime	13/05	15:00 – 16:00	65	84	65	51	Local and distant road traffic dominant
		16:00 – 17:00	63	78	67	52	
		17:00 – 18:00	62	76	66	49	
		18:00 – 19:00	61	76	64	46	
		19:00 – 20:00	60	76	64	46	
		20:00 – 21:00	60	80	64	43	
		21:00 – 22:00	59	77	62	40	
		22:00 – 23:00	56	76	60	35	
	14/05	07:00 – 08:00	58	78	61	38	
		08:00 – 09:00	60	84	64	42	
		09:00 – 10:00	60	80	64	46	
		10:00 –11:00	60	86	64	48	
		11:00 – 12:00	60	75	64	48	
		13:00 – 14:00	61	96	64	44	
		14:00 – 15:00	61	87	64	44	

The daily daytime ambient noise levels were in the range 56 to 65 dB LAeq,1hr. Road traffic movements were noted to be the dominant source of noise at this measurement position. Table 9-2 summarises the measured night-time (i.e. 23:00 to 07:00hrs) noise levels at Location N1.

Table 9-2: Measured Night-time Noise Levels at Location N1

Period	Date	Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)				Notes
			L_{AEQ}	L_{AMAX}	L_{A10}	L_{A90}	
Daytime	13/05	15:00 – 16:00	54	75	56	37	Local and distant road traffic dominant
	14/05	01:00 – 02:00	53	76	54	35	
		02:00 – 03:00	50	77	47	27	
		03:00 – 04:00	48	73	41	25	
		04:00 –05:00	49	75	44	24	
		05:00 – 06:00	48	77	45	31	
		06:00 – 07:00	5176	50	34		

The night-time ambient noise levels were in the range 48 to 54 dB LAeq,1hr. Local and distant road traffic were dominant noise sources during night-time period.

Figure 9-2 shows the time-history graph of measured noise levels between 13th and 14th May 2022 at Location N1.

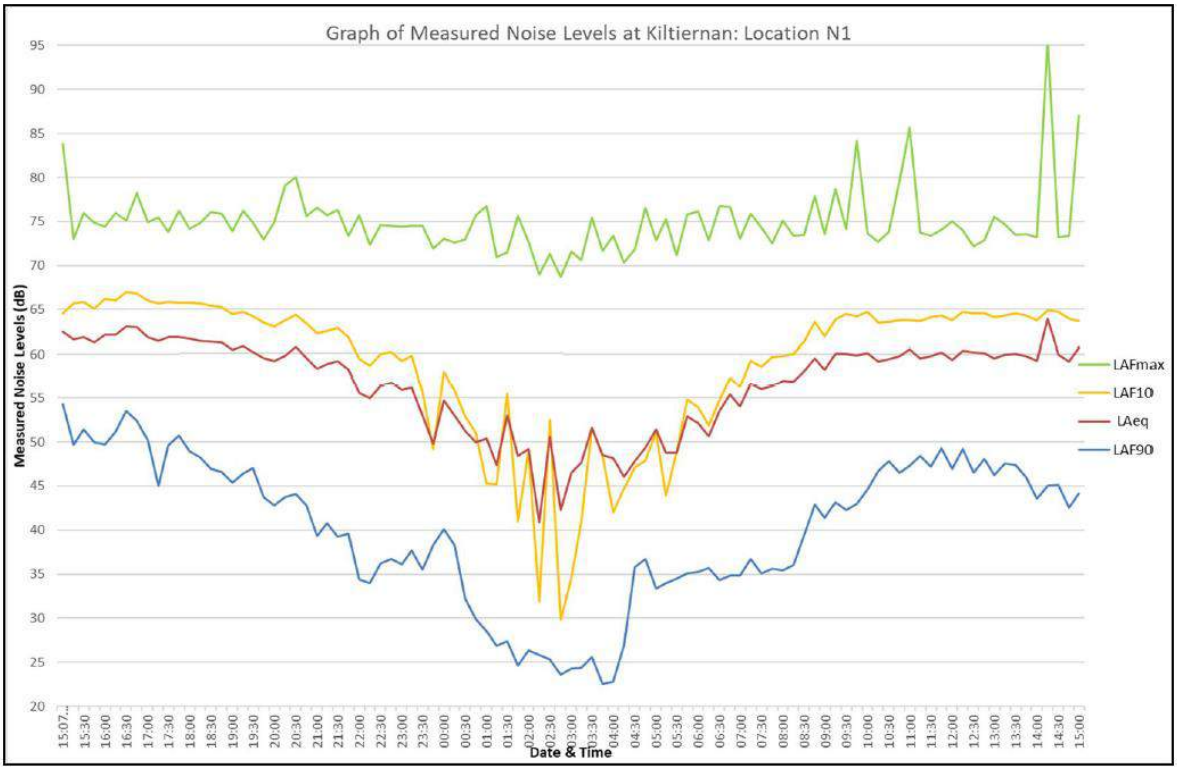

Figure 9-2: Profile of Baseline Noise Monitoring Results at Location N1 (13-14 May 2022)

9.3.3.2 *Location N2*

Table 9-3 summarises the measured noise levels at Location N2.

Table 9-3: Measured Noise Level at Location N2

Period	Date	Time	Measured Noise Levels (dB re. 2x10^{-5} Pa)				Notes
			L_{AEQ}	L_{AMAX}	L_{A10}	L_{A90}	
Daytime	20/05	11:34	61	84	59	47	Local and distant road traffic dominant
		11:49	54	62	57	45	
		12:04	56	75	59	48	

The daytime ambient noise levels were in the range 54 to 61 dB LAeq,15min. Road traffic was the dominant source of noise. Construction noise, birdsong, tree song, cows and children playing nearby were also audible as secondary sources.

9.3.3.3 *Location N3*

Table 9-4 summarises the measured noise levels at Location N3.

Table 9-4: Measured Noise Level at Location N3

Period	Date	Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)				Notes
			L_{AEQ}	L_{AMAX}	L_{A10}	L_{A90}	
Daytime	20/05	10:21	53	57	55	548	Local and distant road traffic dominant
		10:36	53	68	56	49	
		10:51	54	72	56	49	

The daytime ambient noise levels were in the range 53 to 54 dB LAeq,15min. Road traffic was the dominant source of noise. Construction noise, birdsong, treesong and children playing nearby were also audible as secondary sources.

9.3.3.4 *Location N4*

Table 9-5 summarises the measured noise levels at Location N4.

Table 9-5: Measured Noise Level at Location N3

Period	Date	Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)				Notes
			L_{AEQ}	L_{AMAX}	L_{A10}	L_{A90}	
Daytime	20/05	10:11	53	67	55	49	Local and distant road traffic dominant
		10:26	55	65	58	51	
		10::41	55	64	57	51	

The daytime ambient noise levels were in the range 53 to 55 dB LAeq,15min. Road traffic was the dominant source of noise. Construction noise, birdsong, treesong and children playing nearby were also audible as secondary sources.

9.3.4 Noise Impact Assessment Conclusion

Baseline monitoring has found pre-existing noise levels are typical of a suburban location in the vicinity of a busy road network. Future noise emissions from the Glenamuck District Road Scheme (GDRS) have been taken into account and resultant expectant future noise levels on site established via modelling.

The report also considered the potential inward impact of road traffic on the Proposed Development. Assessment methodologies use guidance from The Professional Guidance on Planning & Noise (ProPG), May 2017. The two primary stages of the ProPG assessment are the “Stage 1” initial noise risk assessment of the proposed site and “Stage 2” detailed appraisal of the Proposed Development and preparation of an Acoustic Design Statement.

The site noise survey has also been used to assess the sites noise risk categories, as per the ProPG “Stage 1” assessment. The ProPG noise risk categories, for façades most exposed to road traffic, are Negligible to Medium for daytime and Negligible to Medium/High for night-time periods.

Recommendation to mitigate noise emissions, as specified in the “Stage 2” Acoustic Design Statement, include the following:

- Provision of glazing with minimum sound insulation properties as outlined in this document.
- Provision of acoustic attenuation to ventilation systems for dwellings as outlined in this document.

In the operational phase of the development, criteria have also been set for new building services plant in accordance with the methodologies outlined in BS 4142:2014+A1:2019. It has been concluded that the likely noise impact of the developments in its operational phase is not significant.

In summary, it is considered that the site is suitable for residential development subject to the provision of the noise control recommendations as outlined in this report. The full ProPG: Acoustic Design Statement Report can be found in Appendix H of this EIAR.

9.3.5 Quiet Area Screening

The location of the Proposed Development was screened in order to determine if it is located in or near an area that could be considered a ‘Quiet Area’ in open country according to the Environmental Protection Agency’s publication *Environmental Quality Objectives - Noise in Quiet Areas, 2003.*

The following criteria were assessed for this determination:

- At least 3 km from urban areas with a population >1,000 people;
- At least 10 km from any urban areas with a population >5,000 people;
- At least 15 km from any urban areas with a population >10,000 people;
- At least 3 km from any local industry;
- At least 10 km from any major industry centre;
- At least 5 km from any National Primary Route, and;
- At least 7.5 km from any Motorway or Dual Carriageway.

If the Site does not meet these criteria, it is not considered to be a quiet area as per the definition of the Environmental Protection Agency. ‘Quiet Areas’, according to NG4 (2016), they have a much more stringent noise criterion set out in the guidelines. Before relevant noise criterion can be applied, ‘Quiet Area Screening’ must be performed to identify or rule out the Site as a Quiet Area. Quiet Area screening results can be viewed in

Table 9-6.

Table 9-6: Quiet Area Screening of the Development Location

Quiet Area Screening of the Development Location			
Screening Question	**Answer (Yes/No)**		**Screening Results**
Is the site >3km away from urban areas with a population >1,000 people?	Yes □	No ✓	The Proposed Development is located within 3km of an area with a population >1,000 people.
Is the site >10km away from urban areas with a population >5,000 people?	Yes □	No ✓	The Proposed Development is located within 10km of Carrickmines which has a population >5,000 people.
Is the site >15km away from urban areas with a population >10,000 people?	Yes □	No ✓	The Proposed Development is located within 15km of Stepaside which has a population >10,000 people.
Is the site >3km away from any local industry?	Yes □	No ✓	The Proposed Development is located within 3km of local industry.
Is the site >10km away from any major industry centre?	Yes ✓	No □	The Proposed Development is located within 10km of Sandyford Business Park.
Is the site >5km away from any national primary route?	Yes □	No✓	The Proposed Development is approx. 3.9km west pf the N11.
Is the site >7.5km away from any motorway or dual carriageway?	Yes □	No ✓	The Proposed Development is located approx. 2.2km west of the M50.
QUIET AREA?	**No**		**The Site does not meet these criteria it is not considered to be a quiet area.**

According to the EPA Guidance, *NG4*, where an area is determined not to be a 'quiet area', baseline monitoring should be conducted to determine if there is a low background noise. As the Proposed Development is located in an area which does not meet the criteria as per EPA screening guidelines, a low background noise would not be predicted. As such, baseline noise monitoring for the Site is recommended.

9.3.6 Recommended Noise Limits

In relation to this development, there is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project.

Whilst no specific construction noise limits are set by Dun Laoghaoire Rathdown County Council with respect to noise, the Dublin Agglomeration Noise Action Plan 2018-2023 refers to the use of BS 5228 2009 +A1 2014 Code of practice for noise and vibration control on construction and open sites with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from BS 5228 – 1:2009+a1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.*

BS 5228 – 1:2009+a1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.* This document suggests an absolute construction noise limits depending on the receiving environment. The documents states:

"*Noise from construction and demolition sites should not exceed the level at which conversations in the nearest building would be difficult with windows shut…. Noise levels between 07:00 and 19:00hrs, outside the nearest window of the occupied room closest to the site boundary should not exceed:*

- *70dB in rural, suburban and urban areas away from main road traffic and industrial noise;*
- *75dB in urban areas near main roads in heavy industrial areas."*

The Proposed Development is located in Kilternan, a southern suburb of Dublin. Nearby areas include Carrickmines, Stepaside and Glencullen. Given the suburban context, a limit value of 70dB LAeq,T for construction is considered to be reasonable.

This limit value is also in agreement with those set by Transport Infrastructure Ireland (TII) for construction projects. The 2004 TII document "*Guidelines for the Treatment of Noise and Vibration in National Road Schemes"* outlinest he following construction noise limit values, as outlined in Table 9-2:

Table 9-7: Construction Noise Limits (Source: TII, 2004)

Days and Times	LAeq	LAsmax
Monday to Friday (07:00 to 19:00 hours)	70	80
Monday to Friday (07:00 to 20:00 hours)	60*	75*
Saturdays (08:00 to 16:30 hours)	65	75
Sundays & Bank Holidays (08:00 to 16:30 hours)	60*	65*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the local authority.

9.3.7 Noise

Noise is defined as any sound that has the potential to cause disturbance, discomfort, or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it. In summary, noise can be defined as any unwanted sound. Sound levels are expressed in decibels (dB) on a logarithmic scale, where 0dB is nominally the "threshold of hearing" and 120dB is nominally the "threshold of pain" (refer to Figure 9-1).

Background noise is defined as '*the steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T (LAF90,T)*'. According to the EPA Noise Guidance NG4, an area of low background noise is one where the existing background noise levels measured during an environmental noise survey are as follows:

- Average Daytime Background Noise Level ≤40dB LAF90, and;
- Average Evening Background Noise Level ≤35dB LAF90, and;
- Average Night-time Background Noise Level ≤30dB LAF90.

The Proposed Development is located in Kilternan, a southern suburb of Dublin and does not meet the criteria as per EPA screening guidelines and as such, a low background noise would not be predicted

Figure 9-1 depicts typical sounds and their noise levels on a decibel scale.

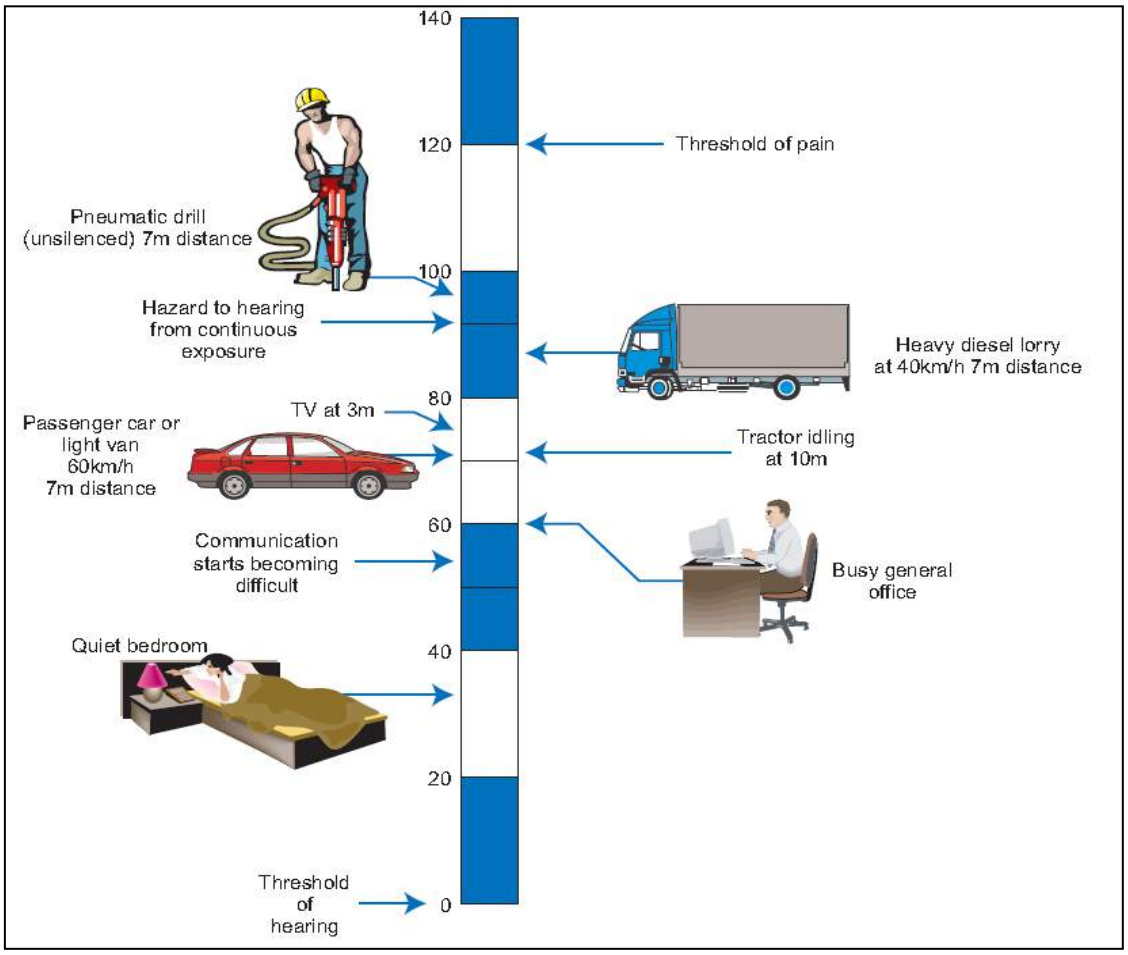

Figure 9-3: Scale and Indicative Noise Levels on the dB(A) Scale (Based on guidance taken from: Design Manual for Roads and Bridges, Volume 11 Consolidated Edition 1993)

9.4 Characteristics of the Proposed Development

9.4.1 Construction Phase

The construction phase is generally divided into five categories:

- Excavation – this includes Site clearing and earthworks required to prepare the Site for building foundations and installing utility services.
- Structure - the structure includes the foundations and the physical frame of the apartment buildings and housing elements. Generally, the frame will be constructed using a combination of in-situ reinforced concrete frame and precast concrete elements with the more low-rise housing units constructed in a combination of block work, timber frame and precast concrete all subject to detailed design.
- Envelope/façade – the building enclosures will be formed using a combination of block work, render, timber frame, glazing and relevant roofing systems all with the

required levels of insulation, ventilation, and weathering in accordance with the relevant building regulations.

- Services – the requisite services will be provided such as drainage, water supply, telecoms, electricity, and lighting which will all be coordinated with the relevant utility providers including obtaining permits and connection agreements where relevant.
- Landscaping – The landscaping works include some hard landscaping, roads, footpaths, cycle-paths, beds and tree planting, and the relevant areas of open space associated with each Phase.

The overall duration of the project is estimated to be 5 no. years in total, with some phases overlapping.

9.4.2 Operational Phase

During the operational phase of the development, no significant sources of noise or vibration are expected with the development. The primary source of outward noise in the operational context relates to any changes in traffic flows along the local road network and any operational plant noise used to serve the ancillary elements within the residential development, creche, offices, medical and retail buildings.

Once the Proposed Development is completed, the potential noise impacts to the surrounding environment are minimal. The residential and commercial aspect of the development is not expected to generate any significant noise sources over and above those which form part of the existing environment at neighbouring residential areas (estate vehicle movements, children playing etc.) and hence no significant impact are expected from this area of the development site.

The main potential noise impact associated with the Proposed Development is considered therefore to relate to the generation of additional traffic to and from the site as a result of the Proposed Development. Potential noise impacts also relate to operational plant serving the development such as heat pumps.

Once operational, there are no vibration sources associated with the development site.

9.5 Potential Impact of the Proposed Development

This section assesses the impact of the Proposed Development on the human environment. The noise-generating activities associated with the Site are as follows:

- Extraction works, including site clearing and earthworks required to prepare the site for building foundations and installing utility services;
- Development construction works;
- Trucks entering and exiting the facility.

9.5.1 Noise Sensitive Locations

The EPA define noise sensitive locations as '*any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels*'.

In identifying sensitive receptors, consideration has been given to residential properties or noise sensitive premises such as schools or hospitals, or recreational spaces within a close proximity of the Proposed Development.

The nearest noise sensitive locations are residential properties which are located approximately 30m - 40m from the Proposed Development Site Boundary.

Table 9-8: Sensitive Receptors

Name	Type	Coordinates		Orientation Relative to Site Boundary
		X	Y	
Cromlech Close/Glenamuck Road	Residential	53.240048	-6.194793	40m North
Rockville	Residential	53.240128	-6.193471	30m East
Wayside Cottages	Residential	53.237752	-6.195784	30m West
Ballycorus Road	Residential	53.235937	-6.191261	30m South

9.5.2 Noise from Operational Traffic

Volume 2, Chapter 12 'Traffic' of this EIAR has been prepared by WS Atkins Ireland Limited Traffic and Transportation Limited (SRC), and concludes that the 70,000Tpa extraction rate equates to a 2.47% increase of traffic flow during the 12-hour daytime period on the R756.

The Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011) states that "*changes in traffic volume on existing roads or new routes may cause either of the threshold values for noise to be exceeded. A change in noise level of 1dB LA10, 18h is equivalent to a 25% increase or a 20% decrease in traffic flow, assuming other factors remain unchanged and a change in noise level of 3dB LA10, 18h is equivalent to a 100% increase or a 50% decrease in traffic flow*".

No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase and therefore no detailed assessment is required as per the DMRB Guidelines. Refer to Chapter 12 of the EIAR for a detailed traffic assessment report.

The impact of noise from operational traffic will be unnoticeable and will not have a negative impact.

9.5.3 Noise from Onsite Plant & Equipment

Noise and vibration can arise from the operation of fixed or mobile machinery used for the Construction Phase and from vehicular traffic during the Operational Phase. Noise prediction calculations have been completed for sound pressure levels from the use of external onsite plant and equipment up to 250m from the source. According to the inverse square law, it can be shown that for each doubling of distance from a point source, the sound pressure level

decreases by approximately 6 dB. Table 9-4 details the noise emissions from the plant or machinery items to be used in the Proposed Development and the relevant L_{Aeq} values at the reference distances. The reference levels were calculated and projected for a range of distances from the source to the appropriate receptor using the following formula:

$$L_{Source} \approx L_{Ref} - 20 \cdot Log10(R2/R1)$$

Where:

L_{Source} = Sound Pressure Level at Initial Location

L_{Ref} = Sound Pressure Level at the new Location

R1 = Distance from the noise source to initial location

R2 = Distance from noise source to the new location

The calculations make a number of assumptions such as:

1. There is a straight line between the source and observer.
2. Meteorological conditions are static.
3. There are no natural barriers that affect attenuation of noise other than distance.
4. All plant items are operating from a single source simultaneously and at full capacity.
5. All plant items are operating at the edge of the work area closest to the sensitive receptor.

The inverse square law is the logical first estimate of the sound you would get at a distant point in a reasonably open area. It is noted that the sound intensity from a point source will obey the inverse square law if there are no reflections or reverberation. If there are barriers between the source and the point of measurement, you are likely to get less than what the inverse square law predicts.

Table 9-4 sets out the equipment associated with the Proposed Development and associated dB(A) levels according to BS 5228-1, and the inverse square law:

Table 9-9: Equipment associated with proposed construction activities

Plant Item	Ref	dB(A) @10m	dB(A) @30m	dB(A) @-40m	dB(A) @ 100m	dB(A) @ 150m	dB(A) @ 200m	dB(A) @ 250m
Loading Shovel	BS 5228-1	76.5	67	64.5	56.5	53	50.5	48.5
Excavator	BS 5228-1	75	65.5	63	55	51.5	49	47
Mobile Crane	BS 5228-1	70	60.5	58	50	46.5	44	42
Generator	BS 5228-1	65	55.5	53	45	41.5	39	37
Dozer	BS 5228-1	81	71.5	69	61	57.5	55	53
Breaker	BS 5228-1	90	80.5	78	70	66.5	64	62
Crusher	BS 5228-1	86	76.5	74	66	62.5	60	58
Excavator	BS 5228-1	75	65.5	63	55	51.5	49	47

Table 9-4 outlines the predicted noise levels at reference distances using *BS 5228-1* recommendations. The predicted noise levels from construction and demolition onsite activities up to 250m from the Site have been included. The nearest noise sensitive locations are located approximately 30m from the Proposed Development Site Boundary. There is the potential for the adopted criteria to be exceeded by the dozer, breaker and crusher during construction and demolition works at the nearest sensitive receptors. However, there are hedgerows on the intervening lands between the Site Boundary and the residential dwellings. It is important to recognise that the sound intensity from a point source will obey the inverse square law if there are no reflections or reverberation. If there are barriers between the source and the point of measurement, you are likely to get less than what the inverse square law predicts. Therefore, when taking account of local terrain, predicted noise levels at the closest residential noise sensitive locations are expected to be lower than what is outlined in Table 9-4. Nevertheless, mitigation measures, as outlined in Section 9.6.1, will be implemented to reduce any potential impacts.

It is not envisaged for any excessively noisy activities to be carried out over extended periods of time during the construction stage.

9.5.4 Potential Cumulative Impacts

Cumulative Impacts can be defined as "*impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*". Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the cumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

The cumulative effects of noise and vibrations from the Proposed Development and other existing developments have been considered, in particular through the generation of nuisance noise. It is not expected that the Proposed Development will result in cumulative impacts with

any existing or proposed offsite projects due to the adherence and full implementation of the appropriate control and mitigation measures .

9.5.5 "Do Nothing" Impact

The Do-Nothing impact has been considered in noise and vibration this Chapter. If the Proposed Development did not proceed, the Proposed Development Site as agricultural lands (grazing of cattle) over an area of 10.8 Ha, including approximately 0.35 Ha of derelict farmyard area.Noise and vibration levels would remain unchanged onsite and at nearby sensitive receptors.

9.6 Avoidance, Remedial & Mitigation Measures

In order to control likely noise impacts caused by the Proposed Development, best available technology will be employed by the Main Contractor to minimise noise from the construction operations and will comply with the mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials will be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

The Main Contractor will monitor the likelihood of prolonged exposure to excessive noise and will commission a noise surveying/monitoring where necessary. The following control measures are to be implemented by the Main Contractor:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise;
- The Main Contractor will assess risk arising from noise prior to each activity taking place and determine appropriate action. The aim will be to minimise the exposure to excessive noise levels;
- If it is likely that the noise exposure exceeds Lower Action Value, then hearing protection willbe made available;
- If it is likely that the noise exposure exceeds Upper Action Value, then hearing protection is mandatory will be used. The work supervisor will decide on the most suitable hearing protection to be used based on exposure and worker's personal preference (earmuffs or earplugs);

- The Main Contractor will ensure proposed measures are put in place and that their effectiveness and suitability is evaluated on regular bases;
- The Main Contractor will minimise noise at work by looking for alternative processes and/or working methods, which would make the work quieter and/or exposure times shorter;
- The Main Contractor will liaise with all sub-contractors to effectively control noise exposure;
- The number of people working near source of the noise will be minimised;
- Plant and machinery will be compliant with current legislation and fitted with silencers where possible;
- Employees must use hearing protection where its use is made compulsory;
- Hearing protection zones will be identified where necessary;
- Spot checks on appropriate use of hearing protection will be carried out;
- Operators of rock breaking machines and workers nearby must wear adequate ear protection;
- During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise;
- All plant to be serviced and maintained in good working order to ensure noise production is kept to a minimum;
- Idle plant to be switched off or throttled down to both save energy and reduce noise emissions;
- All plant operators to be qualified in their specific piece of plant;
- Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable;
- If the Contractor receives a complaint about noise from a neighbour, the Contractor will act immediately to remedy the situation.

Recommendation to mitigate noise emissions, as specified in the “Stage 2” Acoustic Design Statement, include the following:

- Provision of glazing with minimum sound insulation properties as outlined in this document.
- Provision of acoustic attenuation to ventilation systems for dwellings as outlined in this document.

9.6.1 “Worst Case” Scenario

The worst-case scenario where mitigation measures fail for the Proposed Development, it is considered that localised noise will not cause any noise nuisance to nearby receptors.

9.7 Residual Impacts

Residual Impacts are defined *as ‘effects that are predicted to remain after all assessments and mitigation measures’*. They are the remaining ‘environmental costs’ of a Proposed Development and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

No residual impacts are anticipated.

9.8 Monitoring

The control measure outlined in Section 9.6 are to be implemented and furthermore, the Main Contractor will monitor the likelihood of prolonged exposure to excessive noise and commission a noise surveying/monitoring programme where necessary.

9.9 Interactions

9.9.1 Population and Human Health

The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and will not create any major negative impacts beyond the Site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.

It is noted that specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.

9.9.2 Traffic

The Proposed Development will have no significant impact on overall traffic volumes and therefore traffic will not result in any significant increases of noise at sensitive receptors.

9.10 Difficulties Encountered When Compiling

No difficulties were encountered.

9.11 References

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

Department of Environment, Heritage, and Local Government (2004) Quarries and Ancillary Activities: Guidelines for Planning Authorities.

Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011);

Environmental Protection Agency (2006) Environmental Management in the Extractive Industry (Non-Scheduled Materials).

Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities.

Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004.

ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures.

ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels.

ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere.

ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation.

10 LANDSCAPE AND VISUAL ASSESSMENT

10.1 Introduction

This Landscape and Visual impact Assessment Chapter has been prepared in respect of a strategic housing development at this 11.2 Ha site at lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18.

This Chapter assesses the effects of the Proposed Development on the landscape and visual amenities of the area and details the potential direct and indirect effects on landscape fabric, character and quality, and the resulting impact on visual amenity.

This Chapter was prepared by Enviroguide Environmental Consultant Nuno Costa. He has a M.Sc. in Landscape Architecture from Porto University, a Postgraduate Diploma in Advanced Studies in Territory, Environment and Sustainable Development from Lisbon University, and is a PhD student in Landscape Architecture and Urban Ecology. Nuno has 13 years professional experience as a Landscape Architect.

The aim of a landscape and visual assessment is to identify the elements of the landscape which make it unique and the extent to which it is possible to alter these landscapes before unacceptable consequences arise. Landscape character represents the individuality of an area based on its particular combination of features and elements. The purpose of this assessment is to evaluate the existing landscape character of the Site and surroundings, to assess the visual impact of the Proposed Development and to identify landscape designations and planning policies that may concern the Proposed Development Site and its environs.

Landscape Impact Assessment (LIA) relates to assessing effects on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual effects may occur from: Visual Obstruction (blocking of a view, be it full, partial or intermittent) or Visual Intrusion (interruption of a view without blocking).

Cumulative landscape and visual impact assessment is concerned with additional changes to the landscape or visual amenity caused by the Proposed Development in conjunction with other developments, or actions that occurred in the past, present or are likely to occur in the foreseeable future.

10.2 Methodology

This section sets out the methodology for the LVA as result of the Proposed Development.

10.2.1 Guidelines and other information used in the LVA

The assessment has been undertaken in accordance with best practice, legislation and guidance notes. The methodology used was informed by the guidance documents indicated on the References Chapter. However, documents: "*Dún Laoghaire-Rathdown County Development Plan 2022-2028*" and "*The Landscape Institute, 'Guidelines for Landscape and Visual Impact Assessment', (3rd Edition) 2013*" had a special relevance in this analysis.

These documents recommend baseline studies to describe, classify and appraise the existing landscape and visual properties, focusing on any sensitive receptors in the area and the ability of the landscape to accommodate the Proposed Development changes that will occur at the subject Site. This is established through a collective process of desktop study and on-site survey work. Once the baseline conditions are established it allows for the identification of impacts, and an assessment of their magnitude and significance on the landscape character and visual amenities of the area.

A judgement on the sensitivity of the landscape is made from a combination of the susceptibility of the landscape to development, and therefore change, and the value attached to that landscape. This is determined by way of existing designations, both legislative and non-legislative for scenic beauty, landscape quality, recreational value, significant importance, rarity etc. Visual sensitivity is determined by a combination of judgements about the susceptibility of visual receptors such as dwellings, roads, scenic spots etc. to changes in visual amenity and the value attached to these views. The *Guidelines for Landscape and Visual Impact Assessment* state that the aim is "*to establish the area in which the development will be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points*".

10.2.2 Desktop Study

The desktop study comprised the following:

- Establishing an appropriate Study Area from which to study the landscape and visual effects of the Proposed Development;
- Review of Viewshed´s, which indicates areas from which the Development is potentially visible in relation to terrain within the Study Area;
- Review of relevant County Development Plans, particularly with regard to sensitive landscape and scenic view/route designations;
- Selection of potential Viewshed Reference Points (VRPs) from key visual receptors to be investigated during fieldwork for actual visibility and sensitivity.

10.2.3 Fieldwork

Site visits were carried out in order to:

- Select a refined set of VRP's for assessment.

- Record a description of the landscape elements and characteristics within the Study Area generally and also within view from each VRP.
- Capture high quality base photography from which to prepare photomontages of the proposal (Appendix G of this EIAR).

10.2.4 Landscape and Visual Assessment Criteria

The assessment of landscape and visual effects involves a description of the geographic location and landscape context of the Proposed Development as well as a general landscape description concerning essential landscape character and salient features of the wider Study Area. This is discussed with respect to: landform and drainage; vegetation and land use; centres of population and houses; transport routes and; public amenities and facilities. Consideration of design guidance, the planning policy context and relevant landscape designations are also considered.

Once the baseline environment was established, an assessment of the likely potential significant effects associated with the Proposed Development was carried out. This included the following:

- Appraisal of salient landscape character.
- Appraisal of predicted landscape effects.
- Appraisal of predicted visual Viewsheds maps as well as photomontages prepared from selected VRP locations.
- Appraisal of predicted cumulative effects.
- Discussion of mitigation measures.
- Assessment of residual effects following mitigation.

10.2.5 Assessment of Effects

The landscape and visual impact assessment seeks to identify, predict and evaluate the significance of potential effects to landscape characteristics and established views. The assessments are based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor. The assessment acknowledges that landscape and visual effects change over time as the existing landscape evolves and proposed planting establishes and matures. The assessment therefore reports on potential effects during both the construction phase and the operational phase of the Proposed Development. The prominence of the Proposed Development in the landscape or view will vary according to the existing screening effects of local topography, structures and buildings, intervening existing vegetation and type and height of the proposed structures.

10.2.5.1 Landscape Effects

Landscape effects describe the impact on the fabric or structure of a landscape or landscape character. The assessment of landscape effects firstly requires the identification of the components of the landscape. The landscape components are also described as landscape receptors and comprise the following: Individual landscape elements or features; Specific aesthetic or perceptual aspects; and Landscape character, or the distinct, recognisable and consistent pattern of elements (natural and man-made) in the landscape that makes one landscape different from another. The assessment will identify the interaction between these

components and the Proposed Development during construction and operational phases. The condition of the landscape and any evidence of current pressures causing change in the landscape will also be documented and described.

Landscape Value

Landscape value is frequently addressed by reference to international, national, regional and local designations, determined by statutory and planning agencies. However, absence of such a designation does not necessarily imply a lack of quality or value. Factors such as accessibility and local scarcity can render areas of nationally unremarkable quality, highly valuable as a local resource. The quality and condition is also considered in the determination of the value of a landscape. The evaluation of landscape value is undertaken with reference to the definitions stated in Table 10-1.

Table 10-1: Landscape Sensitivity Criteria

Landscape Value	Classification Criteria
High	Nationally designated or iconic, unspoilt landscape with few, if any, degrading elements.
Medium	Regionally or locally designated landscape, or an undesignated landscape with locally important landmark features and some detracting elements.
Low	Undesignated landscape with few if any distinct features or with several degrading elements.

The landscape of the site of the Proposed Development is considered to have a <u>Medium</u> Landscape Value.

Landscape Susceptibility

Landscape susceptibility relates to the ability of a particular landscape to accommodate the Proposed Development. Landscape susceptibility is appraised through consideration of the baseline characteristics of the landscape, and in particular the scale or complexity of a given landscape. The evaluation of landscape susceptibility is undertaken with reference to a three-point scale, as outlined in Table 10-2:

Table 10-2: Landscape Susceptibility Criteria

Landscape Susceptibility	Classification Criteria
High	Small scale, intimate or complex landscape considered to be intolerant of even minor change.
Medium	Medium scale, more open or less complex landscape considered tolerant to some degree of change.
Low	Large scale, simple landscape considered tolerant of a large degree of change.

The landscape of the site of the Proposed Development is considered to have a Medium Landscape Susceptibility.

Landscape Sensitivity

Landscape sensitivity to change is determined by employing professional judgment to combine and analyse the identified landscape value, quality and susceptibility and is defined with reference to the scale outlined in Table 10-3:

Table 10-3: Landscape Sensitivity Criteria

Class	Criteria
High	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value or with highly valued features. Outstanding example in the area of well cared for landscape or set of features that combine to give a particularly distinctive sense of place. Few detracting or incongruous elements.
High-Medium	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape with notable landscape features.
Medium	Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character. Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space. An example of a landscape or a set of features which is neutral or mixed character.
Medium - Low	Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character. No landscape designation present or of medium to low local value, or an example of a common or un-stimulating landscape or set of features and conditions.
Low	Landscape characteristics or features which are tolerant of change without detriment to their present character. No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features.

The landscape of the Site of the Proposed Development is considered to have a Medium to High-Medium Landscape Sensitivity.

Magnitude of Landscape Change

Magnitude of change is an expression of the size or scale of change in the landscape, the geographical extent of the area influenced and the duration and reversibility of the resultant effect. The variables involved are described below:

- The extent of existing landscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape;
- The extent to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones;
- Whether the effect changes the key characteristics of the landscape, which are integral to its distinctive character;
- The geographic area over which the landscape effects will be felt (within the ProposedDevelopment site itself; the immediate setting of the Proposed Development site; at the scale of the landscape type or character area; on a larger scale influencing several landscape types or character areas); and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

Changes to landscape characteristics can be both direct and indirect. **Direct change** occurs where the Proposed Development results in a physical change to the landscape within or adjacent to the Proposed Development site. **Indirect changes** are a consequence of the direct changes resulting from the Proposed Development. They can often occur away from the Proposed Development site (for example, off-site construction staff parking) and may be a result of a sequence of interrelationships or a complex pathway (for example, a new road or footpath construction may increase public access and associated problems e.g. littering). They may be separated by distance or in time from the source of the effects.

The magnitude of change affecting the baseline landscape resource is based on an interpretation of a c

ombination of the criteria set out in Table 10-4.

Table 10-4: Magnitude of Landscape Change Criteria

Magnitude of Landscape Change	Classification Criteria
None	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value or with highly valued features. Outstanding example in the area of well cared for landscape or set of features that combine to give a particularly distinctive sense of place. Few detracting or incongruous elements.
Negligible	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent or a landscape with highly valued features locally. Good example in the area of a well-cared for landscape or set of features that combine to give a clearly defined sense of place.
Low	Landscape characteristics or features which are reasonably tolerant of change without determent to their present character. No designation present or of little local value. An example of an un-stimulating landscape or set of features; with some areas lacking a sense of place and identity.
Medium	Noticeable change, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements.
High	Noticeable change, affecting many key characteristics and the experience of the landscape; and Introduction of many incongruous developments.
Very High	Highly noticeable change, affecting most key characteristics and dominating the experience of the landscape; and Introduction of highly incongruous development .

Its considered that the Proposed Development changes to landscape characteristics are <u>Medium</u>.

10.2.5.2 Visual Effects

Visual effects are determined by the extent of visibility and the nature of the visibility (i.e. how a development is seen within the landscape); for example, whether it appears integrated and balanced within the visual composition of a view or whether it creates a focal point. Negative

visual effects may occur through the intrusion of new elements into established views, which are out of keeping with the existing structure, scale and composition of the view. Visual effects may also be beneficial, where an attractive focus is created in a previously unremarkable view or the influence of previously detracting features is reduced. The significance of effects will vary, depending on the nature and degree of change experienced and the perceived value and composition of the existing view.

Receptors

For there to be a visual impact, there is the need for a viewer. Views experienced from locations such as settlements, recognised routes and popular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e. people, will be affected by changes as a result of the Proposed Development depends on a number of factors.

Value of the View

Value of the view is an appraisal of the value attached to views and is often informed by the appearance on Ordnance Survey of tourist maps and in guidebooks, literature or art. Value can also be indicated by the provision of parking or services and signage and interpretation. The nature and composition of the view is also an indicator. The value of the view is determined with reference to the definitions outlined in Table 10-5:

Table 10-5: Value of the View

Value	Classification Criteria
High	Nationally recognised view of the landscape, with no detracting elements.
Medium	Regionally or locally recognised view, or unrecognised but pleasing and well composed view, with few detracting elements.
Low	Typical or poorly composed view often with numerous detracting elements.

Visual Susceptibility

The GLVIA guidelines identify that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- The occupation or activity of people experiencing the view at a particular location; and
- The extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

For example, residents in their home, walkers whose interest is likely to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience often indicate a higher level of susceptibility. Visual susceptibility is determined with reference to the three-point scale and criteria outlined in Table 10-6.

Table 10-6: Visual Susceptibility

Susceptibility	Classification Criteria
High	Receptors for which the view is of primary importance and are likely to notice even minor change.
Medium	Receptors for which the view is important but not the primary focus and are tolerant of some change.
Low	Receptors for which the view is incidental or unimportant and is tolerant of a high degree of change.

Visual Sensitivity

Sensitivity to change considers the nature of the receptor; for example, a person occupying a residential dwelling is generally more sensitive to change than someone working in a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of the susceptibility of the visual receptor to change as well as the value attached to the view. A judgement is also made on the value attached to the views experienced. This takes account of:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations;
- Indicators of the value attached to views by visitors, for example through appearance in guidebooks or on tourist maps, provision of facilities for their enjoyment (sign boards, interpretive material) and references to them in literature or art; and
- Possible local value: it is important to note that the absence of view recognition does not preclude local value, as a view may be important as a resource in the local or immediate environment due to its relative rarity or local importance.

The visual sensitivity to change is based on interpretation of a combination of all or some of the criteria outlined in Table 10- 7:

Table 10-7 Visual Sensitivity

Visual Sensitivity	Criteria
High	Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes. Dwellings with views orientated towards the Proposed Development.
High - Medium	Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guide books. Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.
Medium	Users of primary transport road network, orientated towards the Development, likely to be travelling for other purposes than just the view. Dwellings with oblique views of the Proposed Development.
Medium - Low	People engaged in active outdoor sports or recreation and less likely to focus on the view. Eg: outdoor workers – agriculture, horticulture Primary transport road network and rail users likely to be travelling to work with oblique views of the Development or users of minor road network.
Low	People engaged in work activities indoors, with limited opportunity for views of the Development.

Magnitude of Visual Change

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the Proposed Development. The magnitude of the visual effect resulting from the development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development;
- The degree of contrast or integration of any new features or changes in the landscape form, scale, mass, line, height, sky lining, back-grounding, visual clues, focal points, colour and texture;
- The nature of the view of the Proposed Development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses;
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the development and the extent of the area over which the changes will be visible; and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

The magnitude of visual effect resulting from the development at any particular viewpoint or receptor is based on the interpretation of the above range of factors and is set out in Table 10- 8:

Table 10-8 Magnitude of Visual Change (Visual effects)

Magnitude	Criteria
Very High	The development will cause significant changes in the existing view over a wide area or a change which will dominate over a limited area.
High	The development will cause a considerable change in the existing view over a wide area or a significant change over a limited area.
Medium	The development will cause modest changes to the existing view over a wide area or noticeable change over a limited area.
Low	The development will cause very minor changes to the view over a wide area or minor changes over a limited area.
Negligible	The development will cause a barely discernible change in the existing view.
None	No change in the existing view.

10.2.6 Duration and Quality of Effects

Table 10-9 provides the definition of the duration of landscape and visual effects:

Table 10-9 Definition of the duration of landscape and visual effects

Duration	Description
Temporary	Impacts lasting one year or less
Short–term	Impacts lasting one to seven years
Medium-term	Impacts lasting seven to twenty years
Long-term	Impacts lasting twenty to fifty years
Permanent	Impacts lasting over fifty years

The quality of both, landscape and visual effects, can be Beneficial (Positive), Adverse (Negative) or Neutral according to the definitions set out in Table 10- 10 overleaf:

Table 10-10 Definition of Quality of Effects

Class	Criteria
Beneficial:	A positive impact which will improve or enhance the landscape character or viewpoint.
Neutral	A neutral impact which will neither enhance nor detract from the landscape character or viewpoint.
Negative	A negative impact which will detract from the existing landscape character or viewpoint.

10.2.7 Significance Criteria

The objective of the assessment process is to identify and evaluate the potentially significant effects arising from the Proposed Development. The assessment will identify the residual effects likely to arise from the finalised design taking into account mitigation measures and the change over time. The significance of effects is assessed by considering the sensitivity of the receptor and the predicted magnitude of effect in relation to the baseline conditions. In order to provide a level of consistency and transparency to the assessment and allow comparisons to be made between the various landscape and visual receptors subject to assessment, the assessment of significance is informed by pre-defined criteria as outlined in the Table 10-11. When assessing significance, individual effects may fall across several different categories of significance and professional judgement is therefore used to determine which category of significance best fits the overall effect to a landscape or visual receptor. The significance of the effects can be adverse (negative) or beneficial (positive) according to the definitions set out in Table 10- 11.

Table 10-11 Categories of Significance of Landscape and Visual Effects

Impact Magnitude	Definition
Imperceptible Impact:	An impact capable of measurement but without noticeable consequences
Minor Impact:	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Impact:	An impact that alters the character of the environment in a manner that is consistent with the existing and emerging trends
Significant Impact:	An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Profound Impact:	An impact which obliterates sensitive characteristics

10.2.8 Study Area

Due to the scale and nature of the Proposed Development within this receiving landscape setting, it is anticipated that the Proposed Development is not likely to give rise to significant landscape or visual impacts beyond approximately. 1km. However, out of an abundance of caution, a 1.5km radius study area is used in this instance, and, exceptionally, a point about

2.5km (VP19) as it is a point with a high elevation, to the west, overlooking the village of Kilternan.

As one moves away from any type of development in the landscape, it will become less perceptible with distance. It is common practice to consider the viewpoint distance as laid out in Table 10 -12 Viewpoint Distance, that identifies and describes the impact of a viewpoint and the distances associated with these visual impacts.

Table 10-12 Viewpoint Distance

Viewpoint Distance	Description
0-2km	It is generally accepted that a development located approximately 2km or less from a viewer would be close enough to allow identification of significant detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts.
2-5km	At this distance, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Impacts at this distance are generally less than those found between 0-2km.
5-10km	Beyond 5km visual prominence quickly diminishes. Certain circumstances/light conditions etc. have potential to allow certain types of development and material finishes to be perceived. The development increasingly becomes part of the general background/distance views. Upwards of 15km distance, developments quickly become minor features within the landscape and considered imperceptible to the average human eye. The impact of the development diminishes as the developments becomes part of the general background/distance views.

The field study also revealed that a number of different elements on the ground have a bearing on the visibility of the Proposed Development:

- Currently, the site is bounded by existing hedgerows along the north/northeast boundaries. In the south/southeast boundaries there are some hedgerows but more desagregated, mainly the the southeast one;
- There is a car business to the north of the Proposed Development, measuring around 7,400 square meters;
- To the north, west and south of the site, the area is composed mostly of residential dwellings, and to the east there are large open fields and very dense tree patches;
- The current state of the site is an open field with herbaceous covering and some pedestrian trails not formalized;
- The land is limited on its west side, to the sidewalk that separates it from the R117, by a stone wall about 1.20 meters high. There are however some flaws in this wall, mainly in the southwest part. There is currently a metal gate that gives access to the land in the middle of this western limit.

10.2.9 Viewsheds

To confirm the visibility of the Proposed Development, Viewsheds were defined in 3 different points of the property (A-C), as it can be seen in the images 10-1 to 10-3.

These Viewsheds were processed using *Google Earth Pro* software, that adjusted the view of the observer 2,00 meters above the terrain. In green, on the images, it can be seen the visibility from the points considered.

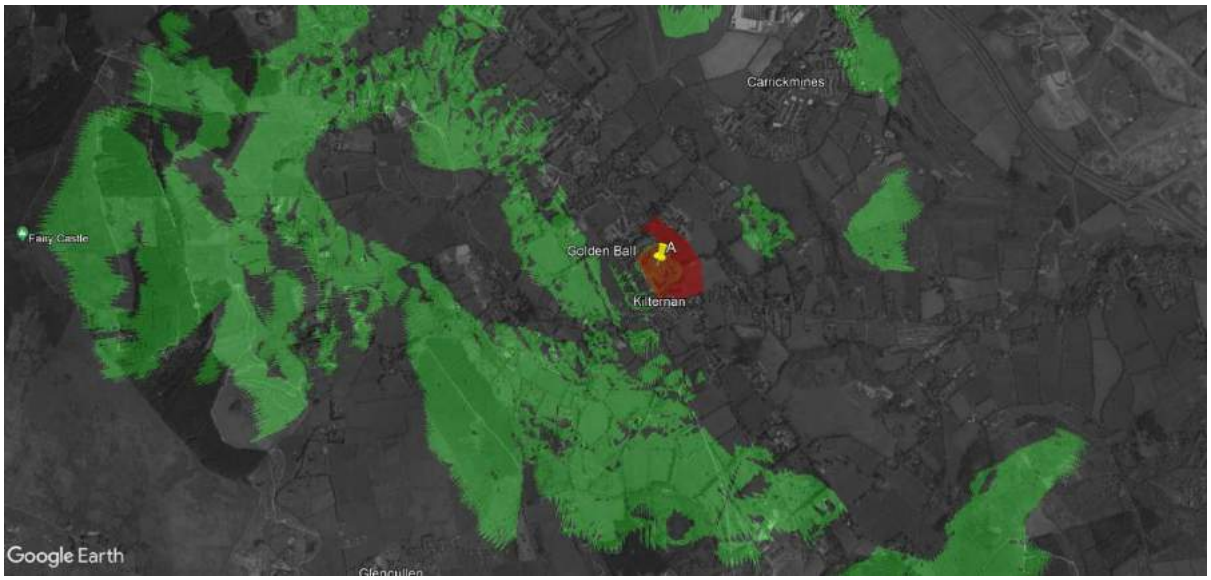

Figure 10-10-1: Viewshed V1

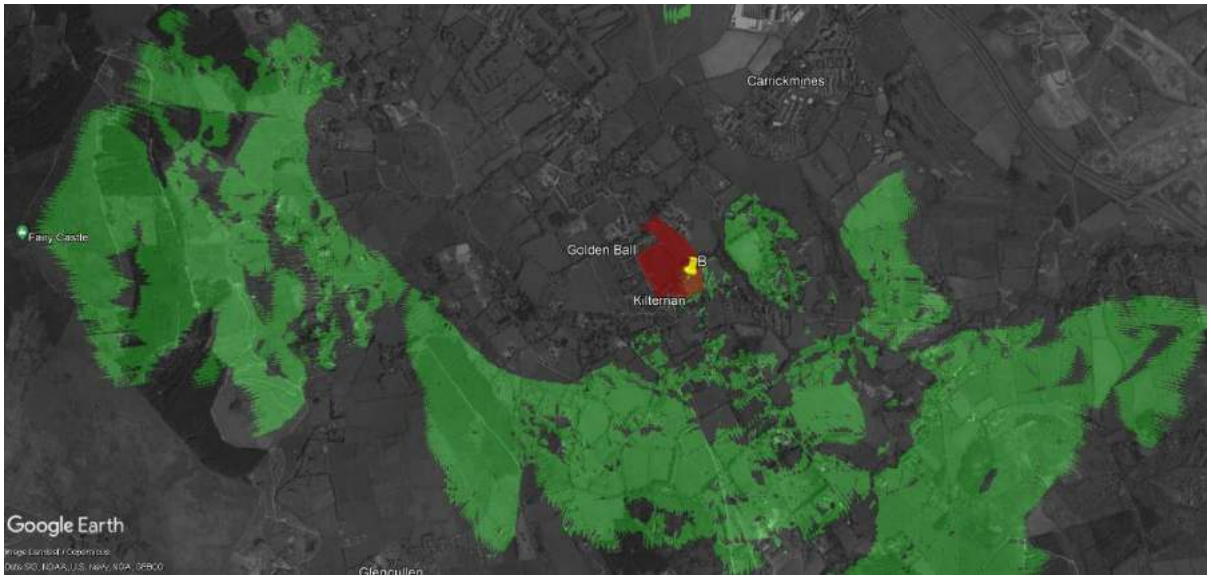

Figure 10-10-2: Viewshed V2

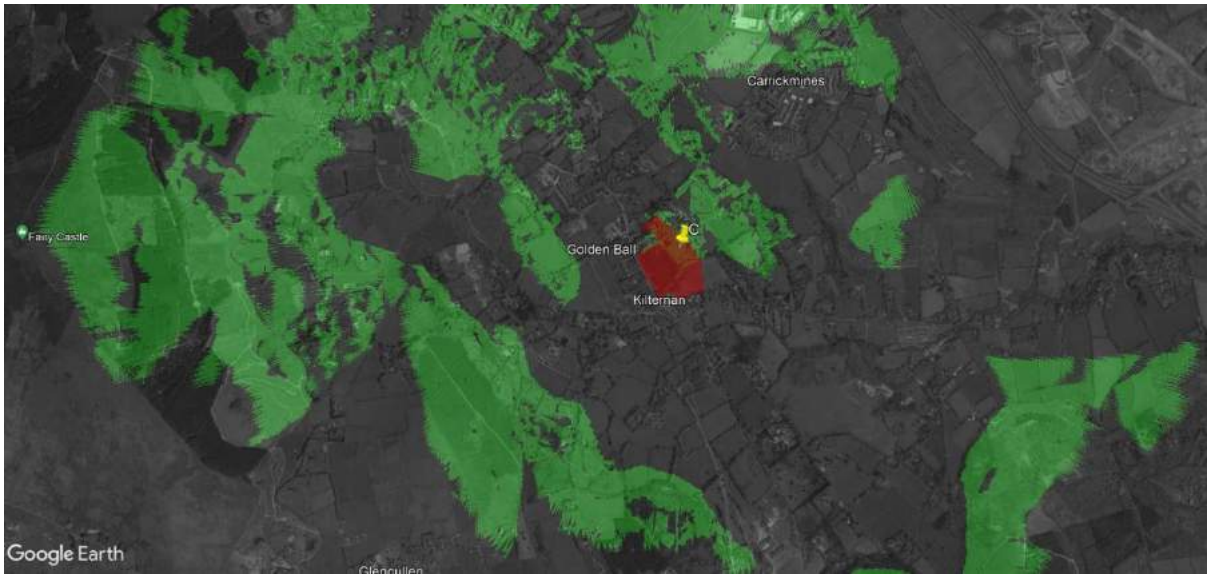

Figure 10-10-3: Viewshed V3

10.2.10 Potential Receptors

Following the production of the Viewsheds and field study, the following possible receptors of impacts were noted.

10.2.10.1 Dwellings with views orientated towards the development

Dwellings with views orientated toward the development are generally accepted as having a high visual sensitivity.

The closest dwelling houses facing the Proposed Development are located to the west, on the other side of the R117, just 15 meters from the site. The Proposed Development is visible from these locations, however, it is not predicted that there will be a negative impact on these dwellings as the Proposed Development is in line with the surrounding environment. It is predicted some negative short term impact on the northwest dwellings, given the existing tree border on that part of the site, that is going to be removed.

10.2.10.2 Users of the High Amenity areas

Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes are generally accepted as having a high to medium visual sensitivity.

There currently appears to be only informal/infrequent use of these lands indicated by some desired lines (grass worn paths).

However, we can highlight the users of the following areas that have visibility to the Site of the Proposed Development:

- *Our Lady of the Wayside Church* users (40 meters) – Very close to the site. Visibility to the entire western part of the Proposed Development, with no apparent blockages of view.
- *Wayside FC Jackson Park* users (250 meters) – Close to the Site but with visibility blocked in part by the existing hedges north of the Proposed Development.

- *Stepaside Golf Course* (800 meters) – Some visibility for the Proposed Development, namely to the buildings in the northern part.
- *Carrickmines Equestrian centre* (1000 meters) – Virtually no visibility for the Proposed Development.
- *The Carrickmines Golf Club* (1300 meters) – Virtually no visibility for the Proposed Development.

10.2.10.3 Outdoor workers

People engaged in outdoor work are not likely to focus on the surrounding view and are generally accepted as having medium to low visual sensitivity.

Due to the residential and agricultural nature of the surrounding landscape, it is not expected that outdoor workers will be impacted by the Proposed Development.

10.2.10.4 Road / transport users

Users of the main roads close to the Proposed Development are generally accepted as having medium to low visual sensitivity.

The R117, to the West, the R118, the Ballycorus road to the South and the Glenamuck road to the North are the main roads in close proximity to the Site of the Proposed Development.

The R116 that connects to the R117, south of the Site.

It is not predicted this will cause any impacts on road users as the Proposed Development is in line with the surrounding land use, and the external façade of the Proposed Development blends in with the surrounding buildings in the area.

No other road or transport route is orientated directly towards the Proposed Development within 1km. The M50 is located more than 2km east of the Proposed Developmnt, and does not have any visibility to the Site.

10.2.10.5 Indoor workers

People engaged in work activities indoors, with limited opportunity for views of the development are generally accepted as having a low visual sensitivity.

10.3 The Existing and Receiving Environment (Baseline Situation)

10.3.1 Site Context

The Site is generally bounded by the Glenamuck Road to the north; hedgerows/trees and the Kilternan Country Market and the Sancta Maria property to the north-west; an existing stone wall and the recently constructed residential development named "Rockville" to the north-east; a1.2m high existing stone wall and the Enniskerry Road to the south-west; dwellings to the south; and open green field lands that will facilitate the future Glenamuck Link Distributor Road to the east. Part of the Site's frontage lies directly opposite Our Lady of the Wayside Church, Kilternan. The lands are located 1.9 km to the south-west of the M50 and Carrickmines Retail Park.

Phase 2 of "Rockville" has been granted permission, and it is planned to link the Proposed Development into Rockville. The future Glenamuck Link Distributor Road is part of the

Glenamuck District Roads Scheme (GDRS), which relates to road proposals servicing the Carrickmines area between the Enniskerry Road and the Glenamuck Road. The scheme has been granted permission by An Bord Pleanála and is due to start construction in Q3/A4 of 2022.

The Proposed Development site is located at the heart of Kilternan village, enjoying frontage onto both the Glenamuck and Enniskerry roads. It is irregularly shaped and is partially bound to the north-west by Kilternan Country Market and the Glenamuck Road, and to the north-east by 'Rockville' residential development. Along its southern boundary, the site is bound by dwellings accessed from Ballycorus Road, (7), , which runs to the south of the subject site.
The lands are currently accessible via existing 3 No. entrances; 2 No. entrances are located along the R117 Enniskerry Road and a pedestrian entrance is provided along the Glenamuck Road. In addition, a neighbouring residential scheme has developed at the north-east of the site (3). The area is serviced by Dublin Bus routes No. 44 and No. 83. The site is also located 1.9km (20 minutes walking distance) from Carrickmines Retail Park, 2.3 km – 2.7 km to the north-east (26-31 minutes walking distancefrom the Ballyogan Wood Luas Stop and 1.9km (3 minutes driving distance) from Exit 15 on the M50 motorway. The most notable features within the village are a pub/restaurant, a farmer's market, a petrol filling station and shop, a car garage and auto service, a crèche and schools such as Kilternan Church of Ireland National School, Our Lady of the Wayside National School and Kilternan Adult Education Centre, as well as religious services in the Village such as Kilternan Parish Church and Our Lady of the Wayside Church. Many of the existing buildings in the immediate area are generally one or two-storeys in height. These facilities and amenities are numbered on the aerial view in Figure 10-4.

Figure 10-10-4: Aerial View with the limits of the Proposed Development in red

1 - Kilternan Parish Church

2 - Kilternan Church of Ireland National School

3 - Our Lady of the Wayside National School

4 - Our Lady of the Wayside Church

5 - Kilternan Adult Education Centre

6 - Rockville House

10.3.2 Topography and Soils

The topography at the Proposed Development Site generally slopes gently from the Enniskerry Road (western boundary) in a northeast direction before falling off sharply toward the eastern boundary of the Proposed Development Site at a gradient of approximately 10%.

Ground elevations at the site range from approximately 143.07mOD in the southwest to 132.85mOD in the northeast of the Proposed Development Site.

The soils beneath the majority of the Proposed Development Site have been mapped by Teagasc (Teagasc, 2022) as '*till derived chiefly from granite (TGr)*' and described as '*deep well drained mineral (Mainly acidic) (AminDW)*'. While the soils beneath a section of the northern portion of the Proposed Development Site and the southeast corner of the Proposed Development Site is mapped by Teagasc (Teagasc, 2022) as '*Made Ground (Made)*'.

10.3.3 Physical Townscape / Landscape Character

The Site is currently predominately greenfield and includes a0.35Ha derelict farmyard area.

The application site lands are surrounded by a fragmented pattern of low density-built fabric comprising low-rise housing and cottages against the backdrop of the Dublin mountains.

10.3.4 Existing Green Structure

Hedgerows were identified on the north and south borders of the property, with the most important hedgerow being located in the centre of the property, forming an "L" from east to west and then from south to north. This hedge is about 260 meters long and 10 meters wide, then continues to the east, where it connects to a green patch of significant importance, as it will be described below.

The northern hedges are very stabilized, separating from another residential area, to the north of the Proposed Development, as well as the Kilternan Country Market and its car park.

The southern hedge is much more disaggregated, existing only some patches of tress and shrubs in the southwest part.

The western and eastern limits of the Site have no tree or shrub vegetation, with only some spontaneous shrubby vegetation along the western wall.

Figure 10-10-5: Aerial View with the limits of the Proposed Development on red. ***Year: 2005***

Figure 10-10-6: Aerial View with the limits of the Proposed Development on red. ***Year: 2015***

Figure 10-10-7: Aerial View with the limits of the Proposed Development on red. ***Year: 2021***

The figures 10-5 to 10-7 show the evolution of land use on the Proposed Development Site, and verify that there are no major changes in this cover or in the hedges already identified above.

10.3.5 Designation and Zoning

According to *Dún Laoghaire-Rathdown County Development Plan 2022-2028* (CDP) the Site zoning in the current Development Plan o for the area is designated:

- "*Objective A -To provide residential development and/or protect and improve residential amenity*."

And

- "*Objective NC'-'To protect, provide for and/or improve mixed-use neighbourhood facilities*."

These objectives are visible in Figure 10-8 where Objective A is represented in yellow and Objective NC is represented in brown.

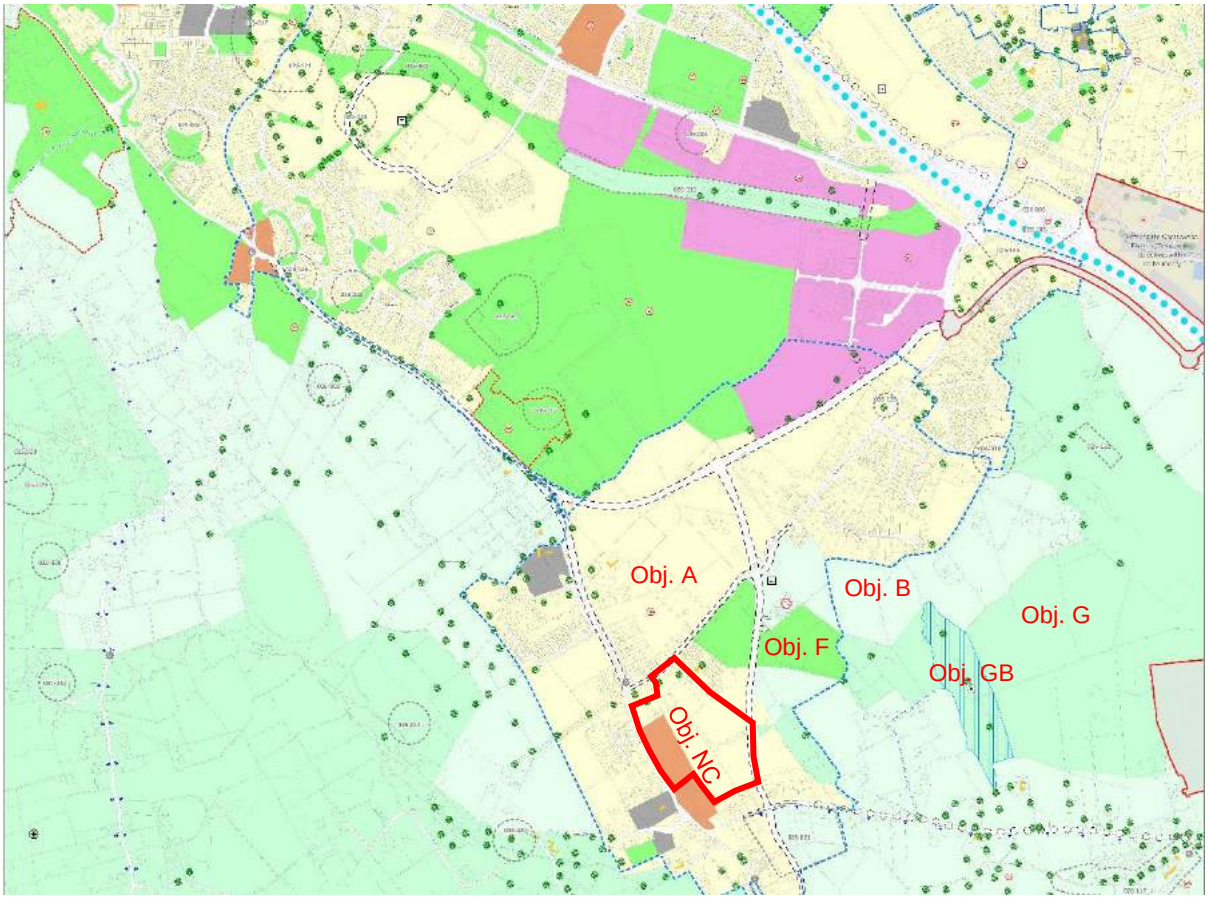

Figure 10-10-8: Extract from the CDP Land Use Zoning Map, section 9

(Indicative limits of the Proposed Development in red)

The project relies on the surrounding physical fabric as it aims to integrate naturally into the existing ad-hoc rural pattern and, at the same time, establishing a more compact built environment in the central area to generate a landscape of active open spaces, streets and permeable connections. Existing natural assets such as mature trees, hedgerows and green ways will be retained and enhanced, connecting to both mountains and sea. The scheme is consistent with the zoning objectives established in the effective Dún Laoghaire-Rathdown CDP for the Proposed Development site.

Taking into account the analysis of the Figure 10-8, it can be verified that there are two large areas identified with a green patch to the north (separated by the Glenamuck Link Distributor Road) that are important for the character of the landscape. They are:

- Objective B - To protect and improve rural amenity and to provide for the development of agriculture.
- Objective F - To preserve and provide for open space with ancillary active recreational amenities.
- Objective G - To protect and improve high amenity areas.
- Objective GB - To protect and enhance the open nature of lands between urban areas.

Figure 10-9 demonstrates that, despite not being within the limits of the Proposed Development, there are nearby areas that must be considered:

- A water body to the south, identified with a blue line;
- Two areas defined as "*open space*" identified in green, to the north;
- An area also defined as "*open space*" to the south, in the area corresponding to the perimeter of the Our Lady of the Wayside Church;
- An area of "*Proposed Natural Heritage Area*" to the east, represented in dashed-blue;
- Areas designated as "*EU Annex Habitats*" represented with 5 red circles and 9 green dashed zones, to the south, and a "*Locally Important Biodiversity Sites (LIBS)*" represented with a dashed purple line, to the east.

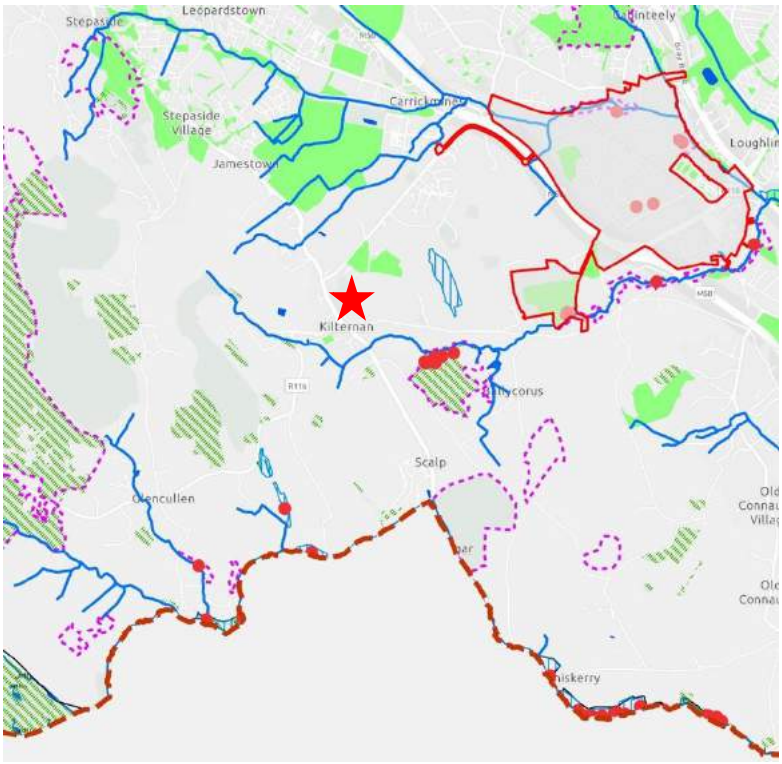

Figure 10-10-9: Extract from the Ecological Network Map (Proposed Development location with a red star)

The current Kilternan-Glenamuck Local Area Plan (LAP) (DLR County Council) sets the objective of providing residential development within the overall Proposed Development site with a neighbourhood centre proposed along the frontage to Enniskerry Road.

As indicated on the LAP map, on Figure 10-10, the residential and neighbourhood centre zoned lands within the application site correspond to Development Parcels 20A and 22. The proposed development of 383 No. residential units and a Neighbourhood Centre reflects the aspirations set out in the Core Strategy, which aims for “2,500 – 3,000 No. residential units for the Kilternan/Glenamuck area...” In addition, a Neighbourhood Centre and ancillary parkland are also envisaged within the Proposed Development site.

The scheme provides a sustainable solution for the city’s growing population, by providing a medium-density development (45 units/ha.) on a largely greenfield site within a growing and vibrant suburban village. It also provides a green-way link zone across the subject site lands, with additional open spaces integrating a well-connected and diverse local green infrastructure network. This will integrate existing mature trees and hedgerows into its open spaces and streets, principally complying with the tree preservation objective set out in the LAP.

The scheme complies with the density standards and height policy established in both the CDP and LAP, which outlines 2 – 4 No. storeys for this subject site, with the exception of two 5-storey apartment blocks.

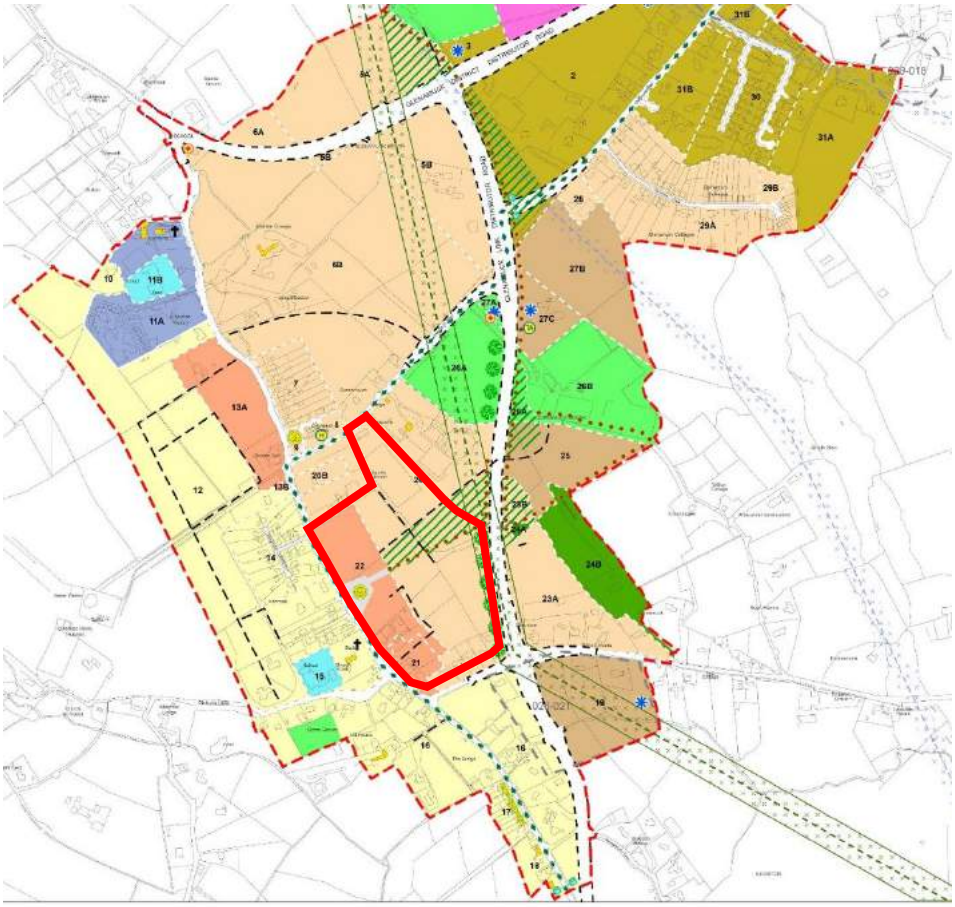

Figure 10-10-10: Extract from the Kilternan-Glenamuck Local Area Plan (DLR County Council) (Proposed Development location with a red boundary)

10.3.5.1 Landscape Character Type and Assessment

According to the Biodiversity Chapter, the Site has 10 habitat types recorded, seven are of local importance (lower value) due to their built structure, low diversity or managed nature. Although evaluated as local importance (lower value), some of these habitats may provide some use albeit limited, for local wildlife and habitat linkage purposes.

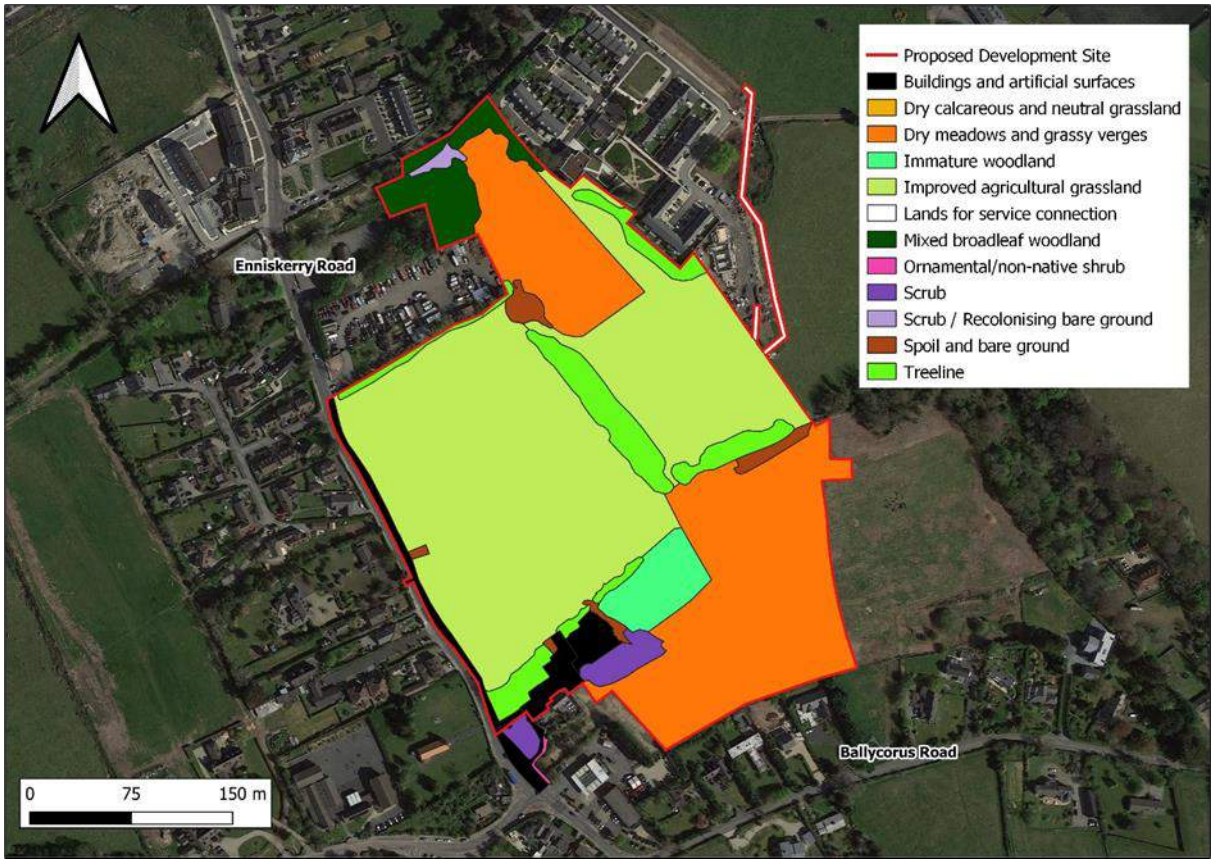

Figure 10-10-11: Habitats recorded within the Proposed Development Site

Improved agricultural grassland (GA1) is improved and highly managed habitats within the Proposed Development site. They have a low species diversity and have limited botanical value. Certain areas of this habitat are actively used for cattle and as a result are heavily poached. A small patch of recolonising bare ground (ED3) is present where previously cleared areas are transitioning back to vegetated grassland. Sections of ornamental / non-native planting (WS3) are present along the driveway to the disused 'Rockville' house and the existing neighbouring property. Small patches of scrub (WS1), with limited botanical value are present throughout the Proposed Development site. The dominant shrub species noted within the proposed development site is *Rubus fruticosus* agg.. An immature woodland (WS2) of *Fraxinus excelsior* is located towards the southern end of the site. This plantation is low in species diversity with the understorey dominated by *Rubus fruticosus* agg., *Hedera helix* and *Urtica dioica.*

This habitat type is present within the northern and southern sections of the site. The most common species are the rank grass species such as *Dactylis glomerata* and *Holcus lanatus* and *Agrostis capillaris* with *Arrhenatherum elatius* also present. There are very few forb species present including *Ranunculus acris*, *Ranunculus repens*, *Plantago lanceolata*, *Chamerion angustifolium, Cirsium arvense*, *Taraxacum officinale* agg., *Trifolium pratense*, *Trifolium repens*, *Lathyrus pratensis*, *Vicia sepium* and *Rumex obtusifolius*.

A section of the dry meadows and grassy verges habitat, particularly in the southern portion shows evidence of poaching and graving by cattle.

Despite the overall low biodiversity value of the dry meadows and grassy verges habitat (i.e., dominated by rank grasses and limited forb species), this grassland is considered to be of local importance (higher value), due to its habitat potential, given the right management.

A number of treelines are present within the proposed development boundary. A smaller treeline is present along the northern border of the site adjoining Boyle's coal yard/southside autos and another is located behind the disused 'Rockville' building and associated outbuildings. A larger more substantial treeline runs through the centre of the site, from northwest to southeast. This treeline joins another which continues west to east. The most dominant species noted through these treelines include *Fagus sylvatica, Fraxinus excelsior, Quercus species, Acer pseudoplatanus, Corylus avellana* and *Sambucus nigra*.

This treelines are considered to be of local importance (higher value), as it forms part of the wider linear habitat network provides a valuable resource for the ecological connectivity of the lands to the surrounding wider area.

Figure 10-10-12: Central treeline within the proposed development site

Broadleaved woodland occurs along the northern boundary of the Proposed Development site. The broadleaved woodland is a mature stand of trees and includes the following tree species *Fagus sylvatica*, *Ulmus* sp., *Tilia* sp., *Fraxinus excelsior*., *Betula pendula and Quercus species*. Understorey vegetation includes *Hedera helix*, *Pteridium aquilinum*, *Rubus fructicosus* agg., holly *Ilex aquifolium* and *Urtica dioica*.

Overall, mixed broadleaved woodland within the Proposed Development site has been valued as local importance (higher value) due to the diversity this habitat provides in the wider landscape as well as the presence of mature established native tree species. Additionally, woodland habitat within the Proposed Development site provides a valuable resource for breeding birds, refuge for terrestrial mammals, and foraging and commuting habitat for bats.

According to the CDP, plans and developments within Dún Laoghaire-Rathdown County must comply with the following policy objectives relevant to the protection of the Landscape:

GIB18: Protection of Natural Heritage and the Environment

It is a Policy Objective to protect and conserve the environment including, in particular, the natural heritage of the County and to conserve and manage Nationally and Internationally important and EU designated sites - such as Special Protection Areas (SPAs), Special Areas of Conservations (SACs), proposed Natural Heritage Areas (pNHAs) and Ramsar sites (wetlands) - as well as non-designated areas of high nature conservation value known as locally important areas which also serve as 'Stepping Stones' for the purposes of Article 10 of the Habitats Directive.

GIB19: Habitats Directive

It is a Policy Objective to ensure the protection of natural heritage and biodiversity, including European Sites that form part of the Natura 2000 network, in accordance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines.

GIB21: Designated Sites

It is a Policy Objective to protect and preserve areas designated as proposed Natural Heritage Areas, Special Areas of Conservation, and Special Protection Areas. It is Council policy to promote the maintenance and as appropriate, delivery of 'favourable' conservation status of habitats and species within these areas.

GIB22: Non-Designated Areas of Biodiversity Importance

It is a Policy Objective to protect and promote the conservation of biodiversity in areas of natural heritage importance outside Designated Areas and to ensure that notable sites, habitats and features of biodiversity importance - including species protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979, the Habitats Directive 1992, Flora (Protection) Order, 2015, Annex I habitats, local important areas, wildlife corridors and rare species - are adequately protected. Ecological assessments will be carried out for all developments in areas that support, or have potential to support, features of biodiversity importance or rare and protected species and appropriate mitigation/ avoidance measures will be implemented. In implementing this policy, regard will be had to the Ecological Network, including the forthcoming DLR Wildlife Corridor Plan, and the recommendations and objectives of the Green City Guidelines (2008) and 'Ecological Guidance Notes for Local Authorities and Developers' (Dún Laoghaire-Rathdown Version 2014).

GIB23: County-Wide Ecological Network

It is a Policy Objective to protect the Ecological Network which will be integrated into the updated Green Infrastructure Strategy and will align with the DLR County Biodiversity Action Plan. Creating this network throughout the County will also improve the ecological coherence of the Natura 2000 network in accordance with Article 10 of the Habitats Directive. The network will also include non-designated sites.

Policy Objective GIB25: Hedgerows
It is a Policy Objective to retain and protect hedgerows in the County from development, which would impact adversely upon them.

In addition, the Council will promote the protection of existing site boundary hedgerows and where feasible require the retention of these when considering a grant of planning permission for all developments. The Council will promote the County's hedgerows by increasing coverage, where possible, using locally native species and to develop an appropriate code of practice for road hedgerow maintenance. The Council will promote the protection of existing hedgerows when considering a grant of planning permission for all developments.

Policy Objective GIB27: Green Belts
It is a Policy Objective to retain the individual physical character of towns and development areas by the designation of green belt areas, where appropriate.

Policy Objective GIB1: Green Infrastructure Strategy
It is a Policy Objective to continue to implement, and update, the DLR Green Infrastructure (GI) Strategy, to protect existing green infrastructure and encourage and facilitate, in consultation with relevant stakeholders, the development, design and management of high quality natural and semi-natural areas. This recognises the ecosystems approach and the synergies that can be achieved with regard to sustainable transport, provision of open space, sustainable management of water, protection and enhancement of biodiversity.

Policy Objective GIB2: Landscape Character Areas
It is a Policy Objective to continue to protect, manage and plan to conserve, maintain or enhance the distinctive characteristics of the County's landscapes, townscapes and seascapes in accordance with the recommended strategies as originally outlined in the Landscape Character Assessment (2002 and since updated), in accordance with the 'Draft Guidelines for Landscape and Landscape Assessment' (2000) as issued by the Department of Environment and Local Government, in accordance with the European Landscape Convention (Florence Convention) and in accordance with 'A National Landscape Strategy for Ireland – 2015-2025'. The Council shall implement any relevant recommendations contained in the Department of Arts, Heritage, and the Gaeltacht's National Landscape Strategy for Ireland, 2015 - 2025.

Policy Objective GIB4: High Amenity Zones
It is Policy Objective to conserve and enhance existing High Amenity Zones and to seek to manage these and other areas to absorb further recreational uses and activity without damaging their unique character.

Policy Objective GIB5: Historic Landscape Character Areas
In assessing development proposals and in the preparation of plans, it is a Policy Objective to have regard to the recommendations and findings of the Historic Landscape Character Assessments (HLCA), already undertaken for a number of the urban-rural fringe areas of the County most likely to come under development pressure.

Policy Objective GIB6: Views and Prospects
It is a Policy Objective to preserve, protect and encourage the enjoyment of views and prospects of special amenity value or special interests, and to prevent development, which would block or otherwise interfere with Views and/or Prospects.

10.3.5.2 Preserved/Protected Views, Protected Areas

There are no Preserved/Protected Views Protected Areas within the study area.

However, it is important to consider the following:

Kiltiernan Plain

This is a large enclosure which comprises the hillocky plain lying between Three Rock to the west Newtown, Barnaslingan (The Scalp) and Carrickgollogan to the south, the disused lead mines and chimney to the east. The enclosure is curtailed to the north by the coniferous plantation on Three Rock. This enclosure is characterized by a series of smaller hillocks within a plain. Roads run between the undulations most notably the main Enniskerry Road running north-south from Stepaside and disappearing into the Scalp. This large hillocky plain which is part of the foothills of the Dublin Mountains accommodates much of the rural development in the County (Kiltiernan and Stepaside). Given its terrain and the number of routeways traversing this plain, it is likely to be subject to the most pressure for long-term development which would significantly alter the existing landscape.

Ballycorus

This is a large enclosure which comprises the hillocky plain lying between Three Rock to the west, Newtown, Barnaslingan (The Scalp) and Carrickgollogan to the south, the disused lead mines and chimney to the east. The enclosure is curtailed to the north by the coniferous plantation on Three Rock. This enclosure is characterised by a series of smaller hillocks within a plain. Roads run between the undulations most notably the main Enniskerry Road running north-south from Stepaside and disappearing into the Scalp. This large hillocky plain which is part of the foothills of the Dublin Mountains accommodates much of the rural development in the County (Kiltiernan and Stepaside). Given its terrain and the number of routeways traversing this plain, it is likely to be subject to the most pressure for long-term development which would significantly alter the existing landscape.

10.3.6 Protected Structures

There are no protected structures within the study area. However, due to the distance to the Proposed Development site, the following protected structures were considered:

1. Catholic Church of Our Lady of the Wayside, known locally as ‘The Blue Church’.

Catholic Church of Our Lady of the Wayside. Detached six-bay double-height single-cell Catholic church, built 1929; dedicated 1929, on a rectangular plan with single-bay three-staged engaged tower to entrance (east) front on a square plan. Renovated with sanctuary reordered. Pitched profiled terracotta tile roof with lichen-covered terracotta ridge tiles terminating in Celtic Cross finial to apex (west), and cast-iron rainwater goods on timber boarded box eaves retaining cast-iron downpipes. Timber boarded walls on timber cushion course on rendered mass concrete plinth with timber band to eaves. Round-headed window openings between timber monolithic "pilasters" with Classical-style timber surrounds framing fixed-pane fittings having square glazing bars. Round-headed window opening to chancel (west) with timber surround framing fixed-pane fitting having leaded stained glass panel.

Round-headed door opening to entrance (east) front with two concrete steps, and timber surround centred on keystone framing timber boarded double doors having fanlight. Roundel (second stage) with timber surround framing fixed-pane fitting having "spoke wheel" glazing bars. Grouped round-headed openings (bell stage) with timber surrounds centred on keystones framing louvered timber fittings. Interior including vestibule (east); square-headed door opening into nave with glazed timber double doors; full-height interior with carpeted central aisle between cruciform-detailed timber pews, timber panelled walls with paired timber stations between frosted glass windows, segmental barrel vaulted ceiling on thumbnail beaded-detailed cornice, and camber-headed chancel arch framing carpeted stepped dais to sanctuary (west) reordered with replacement timber altar table below stained glass "West Window". Set in landscaped grounds with rendered piers to perimeter having shallow pyramidal capping supporting wrought iron double gates.

Reg. No. 60260021
Distance: This is located 0.05km west of the Proposed Development Site.
Impact: This site will not be affected by the Proposed Development.

Visual Impact:

Currently, the view from the Our Lady of the Wayside Church to East overlooks the R117, towards the Southwest of Proposed Development Site.

The view doesn't have much value because there is a spontaneous shrub-hedge that prevents much of the visibility to the east and ends up being marked by the presence of one dwelling (with a blind wall facing the road), a light post in the foreground and the light posts on the lawn that is used by Wayside Celtic FC, on the background.

The Proposed Development ends up becoming the dominant element in this point of view. The visual impact is significant, especially from the garden in front of the church.

However, the view is oriented towards a green amenity area of the Proposed Development, which facilitates better integration with the surroundings, in visual terms.

Special care must be given to the installation and maintenance of this open space, namely to ensure the different strata of vegetation, so that the partial mitigation of this visual impact is ensured.

The typology of the proposed buildings also ends up blending with the urban settlement in this area and the proposed stone wall on the west front helps to maintain the memory of the place in a way, since there was an existing stone wall, and to disguise the proposed buildings.

In the medium term, the view will be dominated by the proposed green structure, namely the trees, and by the stone wall in the foreground, next to the road. The minor visual impact of the proposed buildings will be almost totally mitigated.

2. Rockville House

Detached five-bay two-storey double-pile over basement farmhouse with dormer attic, extant 1757, on a rectangular plan; three-bay two-storey rear (south) elevation. Occupied, 1911. Sold, 1965. Pitched double-pile (M-profile) slate roof centred on pitched (gabled) slate roof with terracotta ridge tiles, red brick Running bond chimney stacks having corbelled stepped

capping supporting terracotta tapered pots, coping to gable, and replacement uPVC rainwater goods on rendered eaves retaining cast-iron conical hoppers and downpipes. Rendered, ruled and lined walls. Segmental-headed central door opening with cut-granite threshold between wrought iron railings, and cut-granite surround framing timber panelled door having fanlight. Square-headed window openings with cut-granite sills, and concealed dressings framing six-over-six timber sash windows without horns. Square-headed window openings to rear (south) elevation with cut-granite sills, and concealed dressings framing six-over-six timber sash windows without horns. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors; and carved timber surrounds to door openings to remainder framing timber panelled doors with timber panelled shutters to window openings. Set in landscaped grounds with rendered, ruled and lined piers to perimeter having cut-granite shallow pyramidal capping supporting wrought iron double gates.

Reg. No. 60260040

Distance: This is located 0.03km east of the Proposed Development Site.

Impact: This site will not be affected by the Proposed Development.

Visual Impact:

The northeast part of the Proposed Development is partially visible behind Rockville House.

This view is marked by the existence of a residential neighborhood with a central garden, recently installed, and surrounded by the road that goes around the accesses to the dwellings. Rockville House occupies a central position in the view from this neighborhood.

The arboreal vegetation installed, in the foreground, still presents a very young size, allowing to see the background, marked by the Rockville House in the centre and the already adult-size trees.

The Proposed Development has a minor visual impact, as it is on a distant visual plan and is partially hidden by the large existing trees, most of them in Rockville House garden.

However, it ends up breaking the framed view to the rustic house in the centre of the image.

Considering the proposed neutral colours and the fact that the buildings have heights similar to those of the existing buildings, it allows a better insertion in this context.

The development of the proposed vegetation in the northeast periphery of the Proposed Development will be important for the mitigation of this visual impact, that will disappear in the medium-term.

3. Knockrose gardens

Knockrose is situated 500 feet above sea level nestling on the shoulder of The Scalp, a geological feature formed by the melting waters of a glacier. Attached to a traditional farmhouse and farm buildings, built on the site of a castle at the edge of The Pale between the border of Dublin and Wicklow, the garden has been evolving over the last seventy years.

The organic 1 acre/.5 hectare garden is packed with a wide variety of cottage garden plants, shrubs and trees interspersed with areas of lawn, a vegetable plot and secluded seating. Early May sees the scented deciduous azaleas in bloom and mid- June/early July is heavenly perfumed by roses and philadelphus. Old granite mushrooms, stepping stones and standing stones along with a variety of Susan Cuffe copper wire sculptures (www.susancuffe.ie) feature throughout.

The wildlife pond is surrounded by mossy granite stones and seeps out to an area for damp-loving plants. Mixed herbaceous beds are located throughout the whole garden and many of them contain bird baths for our feathered friends. A lavender-edged gravel area contains an old Famine Pot (now in use as a tiny pond) which was used here in Knockrose during the Famine years of 1845-1852. This area is backed by roses and clematis which climb on a fence constructed from old horse-drawn harrows which were used on the farm up until the mid-1960's.

Reg. No. 60260040

Distance: This is located 0.500 km southwest of the Proposed Development Site.

Impact: This site will not be affected by the Proposed Development.

Visual Impact: No visual impact is anticipated.

10.4 Characteristics of the Proposed Development

10.4.1 Vision of the Proposed Development

The Neighbourhood Centre building located facing a newly proposed “Village Green” will include Retail, Medical, Office and Crèche uses to serve the new development in addition to the wider environs of Kilternan.

10.4.2 Description of the Proposed Development

Liscove Limited intend to apply to An Bord Pleanála for permission for a Strategic Housing Development at a 11.2 Ha site at lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18, which include a derelict dwelling known as ‘Rockville’ and associated derelict outbuildings, Enniskerry Road, Kilternan, Dublin 18, D18 Y199. The site is generally bounded by the Glenamuck Road to the north; Kilternan Country Market and the Sancta Maria property to the north and west; a recently constructed residential development named "Rockville" to the north-east; the Enniskerry Road to the south-west; dwellings to the south; and lands that will facilitate the future Glenamuck Link Distributor Road to the east.

The Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as ‘Rockville’ and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

Figure 10-10-13: Site Layout Plan *Source: M CROSSAN OROURKE MANNING ARCHITECTS*

A range of high-quality public and communal open spaces have been included in the Landscape Design for the recreational and amenity requirements of future residents and for the wider community.

The Proposed Development will make a positive contribution to the surrounding area by developing a key underutilised site and providing a high-quality residential development and Neighbourhood Centre, which will provide linkages through the site to the neighbouring Rockville development and the future Glenamuck Link Distributor Road (GLDR). The design layout includes several open spaces available to the public such as the village green, a woodland walk, pocket park and the Dingle Way, which will provide amenity and biodiversity. The Proposed Development will have strong connections to surrounding developments and the wider area through a range of high-quality public and communal open spaces and linkages through the site.

Figure 10-10-14: Landscape Architecture Project Masterplan *Source: RMDA Landscape Architects+Consultants*

According to the Landscape Architecture project, the planting strategy key factors are to:

• Create a sense of identity using trees, shrub and hedge planting;

• Create a robust landscape that performs all year round and is suitable for the current proposed use of this site area;

• Use vegetation to screen and enhance views;

• Use a more diverse mix of plant species that will include good pollinators;

• Plant robust species that tolerate drought and site-specific micro-climates;

• Plant species that are maintenance friendly.

10.5 Potential Impact of the Proposed Development

10.5.1 Potential Landscape Impact

Landscape effects – Degree of change to physical characteristics or elements of the landscape, which together form the character of that landscape, e.g. landform, vegetation, boundaries, buildings etc..

The lands at present are mostly in use for agriculture (grazing) with their previous use being as football pitches. These lands are broken into a number of fields and these are separated from one another by hedgerows and tree lines. The lands have been derelict for some time and the hedgerows had become overgrown with scrub hedge vegetation such as Bramble being allowed to grow out on either side to create broader hedges and the hedge plants were also allowed to grow up tall losing their lower vegetation and their effective stock proof quality. In recent times, works have been carried out to clear encroaching scrub species such as Bramble and coarse vegetation to allow for the erection of stock proof fencing. Heavy pruning has also been carried out on stems and branches of trees overhanging the field boundaries and this in some cases has left the crowns somewhat unbalanced with branch stubs remaining.

According to the **Arboricultural Report** and within the tree survey area, which included some trees outside the sites red line boundary, 210 trees have been tagged with 8 trees, 1 tree line and 12 hedges numbered numerically.

Table 10-13 Breakdown of the category grading allocation as per the cascade chart in BS5837 2012

Category Grade	No. of trees
Category U 24 Trees 22 within the sites red line boundary.	Tree Nos. 605, 644, 655, 640, 660, 665, 667, 686, 687, 690, 691, 692, 695, 808, 809, 822, 850, 866, 545, 548, 883, 884, 887 & 890
Category A 2 Trees	Tree Nos. 652 & 656
Category B 55 Trees 54 within the sites red line boundary.	Tree Nos. 607, 629, 631, 632, 633, 634, 653, 641, 642, 643, 645, 646, 647, 648, 649, 650, 654, 657, 658, 659, 638, 661, 662, 663, 664, 666, 669, 670, 677, 693, 696, 697, 698, 535, 700, 801, 802, 803, 804, 805, 807, 811, 812, 815, 816, 818, 836, 843, 869, 870, 874, 875, 877, 878 & 879
Category C 137 Trees (108 within the sites red line boundary. + 12 Hedges (6 within site red line boundary) + 1 Tree Line (outside sites red line boundary)	Tree Nos. 601, 602, 603, 604, 606, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 630, 527, 635, 651, 528, 529, Tree No.1, 530, 531, 532, 533, 636, 637, Tree No.2, 639, Tree No.3, Tree No.4, Tree No.5, 668, 673, 674, 675, 676, 678, 679, 680, 681, 682, 683, 684, 685, 688, 689, 694, 534, 699, 536-544, 806, 810, 813, 814, 817, 819, 820, 821, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 837, 838, 839, 840, 841, 842, 844, 845, 846, 847, 848, 849, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, Tree No.6, Tree No.7, Tree No.8, 547, 546, 868, 871, 867, 872, 873, 876, 880, 881, 882, 885, 886, 888 & 889 Hedge Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12 Tree Line No. 1
Total	218 Trees + 12 Hedges + 1 Tree Line
From the above list, those underlined are outside the sites red line boundary, but have been included due to proximity to the site area. This gives a total of 186 trees, 6 hedges within the sites red line boundary.	

Tree Loss

To accommodate the proposed development and as part of active management, it will be necessary to remove the following vegetation:

Table 10-14 Tree Loss

Category Grade	No. of Trees for Removal
Category U 11 Trees + 9 Trees	Tree Nos.605, 660, 665, 667, 690, 545, 548, 883, 884, 887 & 890 These trees, although most of them need to be removed directly due to the development layout, are in such a condition that they will need to be removed as part of management now or in the short-term irrespective of the development proposals for this site area. Tree Nos. 644, 655, 686, 691, 692, 808, 809, 822 & 850 are not directly affected by the development layout, but are being recommended for re-moval as part of active management due to their condition.
Category A 0 Trees	Tree Nos. ---
Category B 18 Trees	Tree Nos. 607, 657, 661, 662, 663, 664, 666, 669, 670, 698, 815, 870, 869, 874, 875, 877, 878 & 879
Category C 28 Trees + 4 Hedges + c.66m of another + 5,836m2 of scrub/ nursery stock area	Tree Nos. 606, 608, 609, 610, 614, 615, 616,Tree 3, Tree 4, Tree 5, 668, 699, 535, 871, 868, 546, 547, 867, 872, 873, 876, 880, 881, 882, 885, 886, 888 & 889 Hedge Nos. c.66m of hedge 2, all of hedge Nos.5, 6, 7 & 8 and a scrub/nursery stock area of 5,836m2
Total	66 Trees + 4 Hedges + c.66m of another + a scrub/nursery stock area. Note, no trees outside the sites red line boundary are being removed to facilitate the proposed development.

In summary, 66 (35.5%) of the 186 No. trees assessed and included within our condition assessment within 'Appendix 2' are proposed for removal along with 4 full hedges and c.66m of another plus a scrub/nursery stock area.

The trees for removal are made up of the following category grades:

- 20No. of the 22 category 'U'. trees = 90.9%
  (9no. of these are being removed as part of management to address safety to the surrounding area and not directly impacted by the proposed development)
- 0No. of the 2 Category 'A' trees = 0%
- 18No. of the 54 Category 'B' trees = 33..3%
- 28No. of the 108 Category 'C' trees = 25.9%

10.5.1.1 Construction Phase

During the Construction Phase that is expected to last 5 years, the site landscape will undergo a change. Expected landscape impacts include:

- Numerous large, brightly coloured earth moving equipment, construction machinery, cranes operating on the site and construction site offices/facilities, security lighting and fencing etc;

- Change in colour and form of topography due to the excavation, removal and storage of soils;
- Removal of hedgerows (trees and shrubs), mainly in the south limit of the Proposed Development;
- Creation of areas of hard surfaces (car parks, paths, roads);
- Construction of proposed new buildings;
- Planting of proposed green structure (trees, shrubs, herbaceous, lawns);

These landscape impacts will reduce rapidly with distance from the site boundaries, and intervening hedgerows, open park spaces, and existing buildings will further reduce the impacts to minor to negligible, negative and short term for the Construction Phase.

It is concluded that the Proposed Development will, therefore, have a minor, negative and short to medium-term impact on the landscape character of the Site during the Construction Phase.

10.5.1.2 Operational Phase

It is not expected that the Operational phase of the Proposed Development will cause any negative impact.

It is considered, in the context of the Development Plan zoning, the Proposed Development is a continuation of existing trends in the local area.

The potential landscape impacts will be neutral and long-term as a result of the Proposed Development.

10.5.2 Visual Impacts

Visual effects – Degree of change to an individual or group of people (receptors) view of that landscape, e.g local residents, walkers, tourist viewpoint, motorists passing through the area, etc.

10.5.2.1 Visual Receptor Sensitivity

In terms of visual sensitivity, the receptors will be categorised as those being:

- Typically, non-designated viewpoints of modest visual amenity representing local residential receptors. These are deemed to be of **Medium-low** visual sensitivity.
- Typically, single designation viewpoints representing tourists / visitors or local residents involved in recreational or amenity based activity where an appreciation of the visual setting is integral to the experience and pleasant views are afforded These are deemed to be of **Medium** visual sensitivity.

- Typically, an amenity and/or heritage feature viewpoint with aesthetic and/or extensive views, but without any scenic designation. This is deemed to be of **Medium** visual sensitivity.
- Typically, a scenic designation viewpoint, in combination with a separate heritage/amenity designation These are deemed to be of **High-Medium** visual sensitivity.

10.5.2.2 Magnitude of Visual Impact

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the Proposed Development. Photomontages are a 'photo-real' depiction of the scheme within the view, utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Existing View
2. Montage View

The baseline photography was carried out in September 2021 and thus, deciduous trees are still in leaf. In this instance seasonal factors are not considered to contribute to material differences in the visual impacts assessed below and any likely variations will be described.

10.5.2.3 Viewpoint Locations

A total of 20 viewpoint locations were selected for use in the photomontage assessment of visual effects (Appendix G of this EIAR). Views and visibility from these locations are described and assessed in greater depth in the sections to follow. It is important to note that photomontages are tools to assist the visual assessment and do not represent all views of the proposed development from surrounding areas, in most cases the viewpoints were selected for their open and unobstructed view of the proposed development site. It is not possible to present every view and every location by means of viewpoints. The choice of viewpoint locations is influenced by both the views available and the type of viewer. Choice of viewpoint locations aimed to incorporate prominent visual receptors where there is likely to be either a high residential receptors or regular motor traffic. The choice of viewpoint locations should cover locations where the Proposed Development will be completely visible as well as partially visible and the choice of viewpoint locations in this instance did so.

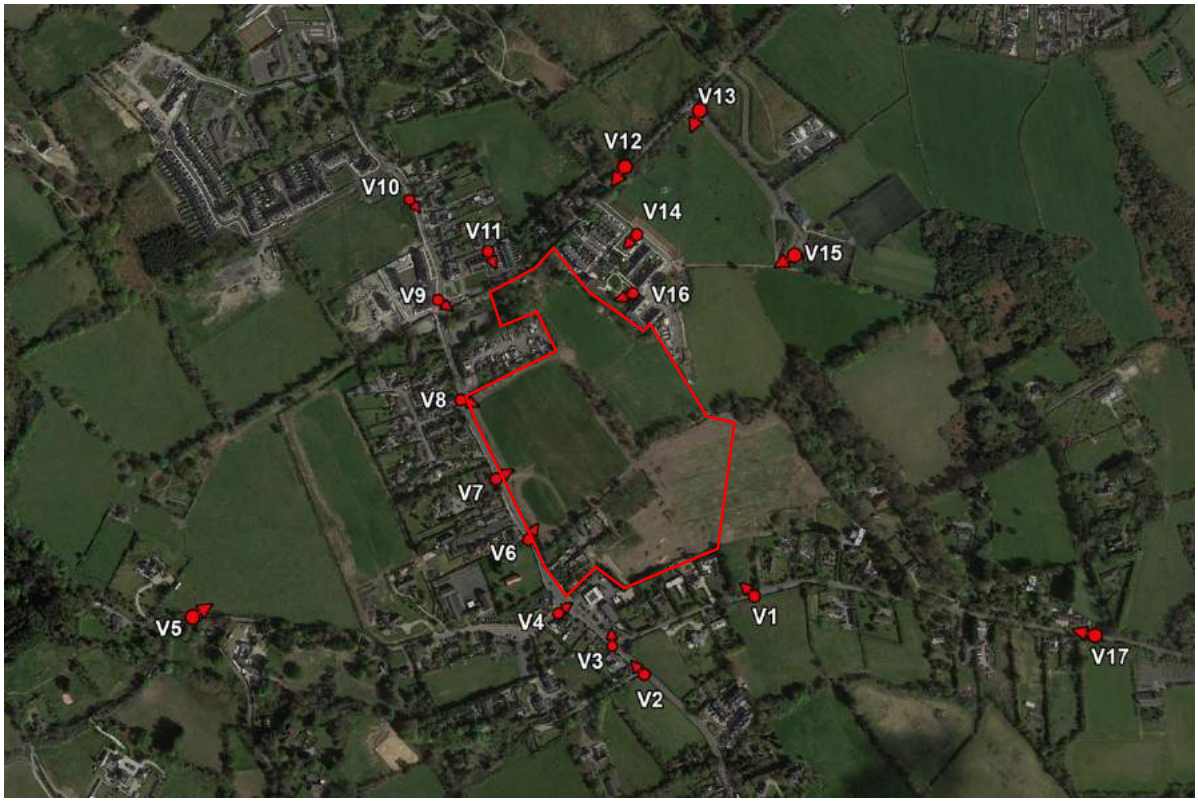

Figure 10-15 Location of Proposed Viewpoints (Proposed Development on red)

Figure 10-16 Location of Proposed Viewpoints (Proposed Development in red)

10.5.2.4 Viewpoint Assessment

Whether a visual effect is deemed to be positive, negative or neutral involves a degree of subjectivity. What appears to be a positive effect to one viewer could be deemed to be a negative effect by another viewer. All predicted visual effects of the viewpoints below are long term and direct effects.

The photomontages that follow were prepared by *3D Design Bureau* to represent, as accurately as possible, the physical and visual characteristics of the Proposed Development from a variety of distances and directions around the site (See Photomontage Report in Appendix G of this EIAR).. Priority was given to views from the public domain, such as main roads and to views from potentially sensitive locations such as residential areas. The location of all views is shown on Figures 10-15 and 10-16. For each of the visuals, an existing and a proposed view is presented and where the proposed development is not visible in the view the elements of the development will be shown as a red outline.

- ***Viewpoint 1***

Figure 10-17 Viewpoint 1, Ballycorus Road, Existing View

Figure 10-18 Viewpoint 1, Ballycorus Road, Proposed View

Viewpoint 1 (Figures 10-17 and 10-18)	
Location	Ballycorus Road
Coordinates	Latitude & Longitude:53.14874, -6.112307
Viewing distance to site boundary	75m
Direction of View	S / SE
Existing View	View marked by the presence of the high voltage pole in the foreground and another high voltage pole in the background. A hedgerow that limits the primate property also marks this landscape, separating the dwelling (that is not visible) from the meadow on the right. Some dispersed large trees are also visible in the background. The separation between the road and the private terrain is made by a low stone wall as one access to this terrain is made by a metal gate, visible from this point.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing hedgerow. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint 2***

Figure 10-19 Viewpoint 2, R117 (near unnamed road intersection), Existing View

Figure 10-20 Viewpoint 2, R117 (near unnamed road intersection), Proposed View

Viewpoint 2 (Figures 10-19 and 10-20)	
Location	R117 (near unnamed road intersection)
Coordinates	Latitude & Longitude:53.14522, -6.113021
Viewing distance to site boundary	135m
Direction of View	S
Existing View	View from the R117, to the north, towards the Proposed Development. This road marks the visibility from this point of view. The wall that separates it from a private property to the east, about two meters high and covered with vines, also marks this view. A medium/large size tree is also visible behind the aforementioned wall, on the side of the private land, and also, partially, the petrol pump to the north. On the left side of the road part of a small dwelling is visible.
Value of the View	Low
Visual Susceptibility	Medium
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing wall covered with vegetation. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint 3***

Figure 10-21 Viewpoint 3, R117 (near Ballycorus Road intersection), Existing View

Figure 10-22 Viewpoint 3, R117 (near Ballycorus Road intersection), Proposed View

Viewpoint 3 (Figures 10-21 and 10-22)	
Location	R117 (near Ballycorus Road intersection)
Coordinates	Latitude & Longitude:53.14658, -6.113295
Viewing distance to site boundary	85m
Direction of View	S
Existing View	View marked by the commercial building about five meters high (Green Auto Service) and the associated signs and parking lot. This building is separated from the road by a small stone wall that gives some continuity in the reading of the wall that follows to the east, with a greater height. It is also visible to the north of this building, the gas station and, in a more distant plan, some dwellings. The tree/shrub hedge that separates the commercial building from the property to the east also marks this view.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing petrol station and vegetation on the background. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint 4***

Figure 10-23 Viewpoint 4, R117 (near R116 intersection), Existing View

Figure 10-24 Viewpoint 4, R117 (near R116 intersection), Proposed View

Viewpoint 4 (Figures 10-23 and 10-24)	
Location	R117 (near R116 intersection)
Coordinates	Latitude & Longitude:53.14803, -6.113676
Viewing distance to site boundary	25m
Direction of View	S
Existing View	View from the R116 to the northwest marked by the petrol station, on the left and the existing tree vegetation that ends up not having a continuous reading, since there are several species and different sizes. There are also several incongruous elements such as signs, posts, fences, and walls that end up contributing to a somewhat disordered landscape. It is still visible, already inside the Proposed Development site, a building partially in ruins. At the southern edge of the Proposed Development an arboreal hedge with large trees is still visible.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	High
Magnitude of Visual Changes	Medium
Duration of Effects	Medium to Long-term
Quality of Effects	Neutral to Negative
Significance of Landscape and Visual Effects	Moderate
Conclusion or Visual Impact of Proposed Development	The visual impact of the Proposed Development turns out to be moderate because it implies the removal of the existing hedge in the southwest part of the site, which used to make the visual connection to the hedge further East. Vegetation is planned on this boundary of the Proposed Development, which will partially mitigate the identified visual impact. Vegetation, especially trees or shrubs, could be reinforced at this point to facilitate this mitigation.

- ***Viewpoint 5***

Figure 10-25 Viewpoint 5, Bishop's Ln. (near Bishops Lane Cemetery), Existing View

Figure 10-26 Viewpoint 5, Bishop's Ln. (near Bishops Lane Cemetery), Proposed View

Viewpoint 5 (Figures 10-25 and 10-26)	
Location	Bishop's Ln. (near Bishops Lane Cemetery)
Coordinates	Latitude & Longitude:53.14714, -6.12556
Viewing distance to site boundary	500m
Direction of View	SW
Existing View	View from Bishop's Ln., North of Bishops Lane Cemetery, to the East. Great visual range of an open field and in the background a line of trees mixed with some dwellings. The low voltage post and associated overhead electrical cables end up partly breaking the unity of this landscape.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing hedgerow. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint 6***

Figure 10-27 Viewpoint 6, R117 (near Lady of the Wayside Church), Existing View

Figure 10-28 Viewpoint 6, R117 (near Lady of the Wayside Church), Proposed View

Viewpoint 6 (Figures 10-27 and 10-28)	
Location	R117 (near Lady of the Wayside Church)
Coordinates	Latitude & Longitude:53.141080, -6.113903
Viewing distance to site boundary	8m
Direction of View	SW / W
Existing View	View from the R117, in front of Our Lady of the Wayside Church,a protected structure, towards the Southwest of Proposed Development site. There isn't any physical barrier between the public space and the site. The view ends up not having much value because there is a spontaneous shrub hedge that prevents much of the visibility to the east. The view ends up being marked by the presence of the light post in the foreground and the light posts on the lawn that is used by Wayside Celtic FC, on the background.
Value of the View	Low
Visual Susceptibility	Medium
Visual Sensitivity	High
Magnitude of Visual Changes	High
Duration of Effects	Medium to Long-term
Quality of Effects	Neutral to Beneficial
Significance of Landscape and Visual Effects	Moderate to Significant
Conclusion or Visual Impact of Proposed Development	The Proposed Development ends up becoming the dominant element in this point of view. The visual impact is significant, especially from the garden in front of the church. However, the view is oriented towards the green amenity area further west of the Proposed Development, which facilitates better integration with the surroundings, in visual terms. Special care must be given to the installation and maintenance of this open space, namely ensure the different strata of vegetation, so that the partial mitigation of this visual impact is ensured. The typology of the proposed buildings also ends up blending with the urban settlement in this area and the proposed stone wall on the west front helps to maintain the memory of the place in a way, since there was an existing stone wall, and to disguise the proposed buildings. In the medium term, the view will be dominated by the proposed green structure, namely the trees, and by the stone wall in the foreground, next to the road. The minor visual impact of the proposed buildings will be almost totally mitigated.

- ***Viewpoint 7***

Figure 10-29 Viewpoint 7, R117, Existing View

Figure 10-30 Viewpoint 7, R117, Proposed View

Viewpoint 7 (Figures 10-29 and 10-30)	
Location	R117 (in front of one of the accesses to the Proposed Development area)
Coordinates	Latitude & Longitude:53.141381, -6.114201
Viewing distance to site boundary	8m
Direction of View	W
Existing View	View from the R117 (Enniskerry Road) towards the West of Proposed Development site, with one of the currently existing accesses being visible, through a metal fence. The small stone wall that forms the boundary of the property on this western front ends up having a significant visual impact, allowing to see an open field behind with a line of trees with some flaws on the eastern edge of the property. The electricity pole in the foreground ends up having a considerable negative visual impact.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	High
Magnitude of Visual Changes	High to Very High
Duration of Effects	Long term to Permanent
Quality of Effects	Neutral to Negative
Significance of Landscape and Visual Effects	Significant
Conclusion or Visual Impact of Proposed Development	The Proposed Development ends up becoming the dominant element in this point of view, cutting the view to the background. In the short to medium term, the visual impact will be significant, mostly from the dwellings across the road on the west. The height of the proposed buildings, as well as the choice of neutral colors, helps to better integrate with the semi-urban context of the area. With the growth of the proposed arboreal vegetation between the R117 and the buildings on the west boundary of the Proposed Development the visual impact will be partially mitigated, with the proposed buildings further in the background being quickly hidden by the vegetation proposed for the communal space.

- ***Viewpoint 8***

Figure 10-31 Viewpoint 8, R117, Existing View

Figure 10-32 Viewpoint 8, R117, Proposed View

Viewpoint 8 (Figures 10-31 and 10-32)	
Location	R117
Coordinates	Latitude & Longitude:53.141754, -6.114493
Viewing distance to site boundary	8m
Direction of View	NW
Existing View	View of R117, from a point very close to the northwest edge of the Proposed Development site. The hedgerow that separates the site and the Sancta Maria Property marks this view, with the stone wall bordering the property also having a significant impact. In the background a line of trees are still visible, with their continuity interrupted by the presence of a high voltage pole. In the foreground of the image, an electricity pole and associated electrical aerial cables turn out to be dissonant elements, in relation to the unity of the view.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	High
Magnitude of Visual Changes	High
Duration of Effects	Long term
Quality of Effects	Neutral to Negative
Significance of Landscape and Visual Effects	Moderate to Significant
Conclusion or Visual Impact of Proposed Development	The visual impact of the Proposed Development turns out to be moderate to significant, since there is a big change in relation to the existing typology, and the reading of the background to East is also lost. The preservation of the hedgerow to the northwest turns out to be fundamental to maintain the physical and visual separation of the site. The growth of trees between the road and the proposed dwellings will partially mitigate the visual impact. The typology of the proposed dwellings ends up integrating well with the existing context, with the building in the northwest corner having the most visible impact, as it is slightly higher than the other dwellings.

- ***Viewpoint 9***

Figure 10-33 Viewpoint 9, R117 (near Glenamuck Road intersection), Existing View

Figure 10-34 Viewpoint 9, R117 (near Glenamuck Road intersection), Proposed View

Viewpoint 9 (Figures 10-33 and 10-34)	
Location	R117 (near Glenamuck Road intersection)
Coordinates	Latitude & Longitude:53.142238, -6.114692
Viewing distance to site boundary	80m
Direction of View	NW
Existing View	View from the R117 (near Glenamuck Road intersection) to the south towards the Kilternan Country Market site. The view is dominated by the presence of herbaceous/sub-shrub vegetation associated with the existing stone wall, but mainly by the large trees on the background. The dissonant elements that end up breaking the existing unit are the signal posts and traffic lights.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, with visibility being blocked by existing wall and vegetation in the background. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint 10***

Figure 10-35 Viewpoint 10, R117 (near Glenamuck Road intersection), Existing View

Figure 10-36 Viewpoint 10, R117 (near Glenamuck Road intersection), Proposed View

Viewpoint 10 (Figures 10-35 and 10-36)	
Location	R117
Coordinates	Latitude & Longitude:53.142775, -6.115002
Viewing distance to site boundary	200m
Direction of View	NW
Existing View	View from the R117 (near Glenamuck Road intersection), to the south. Landscape somewhat ordered with the physical and visual separation between the road and the dwellings made by a stone wall that is only interrupted in the accesses to the houses. Some scattered trees that break the reading for the dwellings. The most dissonant element of this view is the electrical pole and overhead electrical cables. From this point of view, the Proposed Development site is visible, being dominated by the existing vegetation.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing dwellings and vegetation. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint 11***

Figure 10-37 Viewpoint 11, Unnamed Road (close to Glenamuck Road), Existing View

Figure 10-38 Viewpoint 11, Unnamed Road (close to Glenamuck Road), Proposed View

Viewpoint 11 (Figures 10-37 and 10-38)	
Location	Unnamed Road (close to Glenamuck Road)
Coordinates	Latitude & Longitude:53.142441, -6.114299
Viewing distance to site boundary	35m
Direction of View	N / NW
Existing View	View to a set of uniform dwellings and their parking spaces. To the north, in the central position of this view, it is possible to see the Site of the Proposed Development which is dominated by the presence of mostly medium-large arboreal vegetation. A dwelling in the foreground also has a significant visual impact, with a different typology from those already mentioned, but which will be partially hidden from this point of view with the growth of the tree recently installed on the flowerbed.
Value of the View	Medium
Visual Susceptibility	High
Visual Sensitivity	High
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, with visibility being blocked by existing hedgerow. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint 12***

Figure 10-39 Viewpoint 12, Glenamuck Road, Existing View

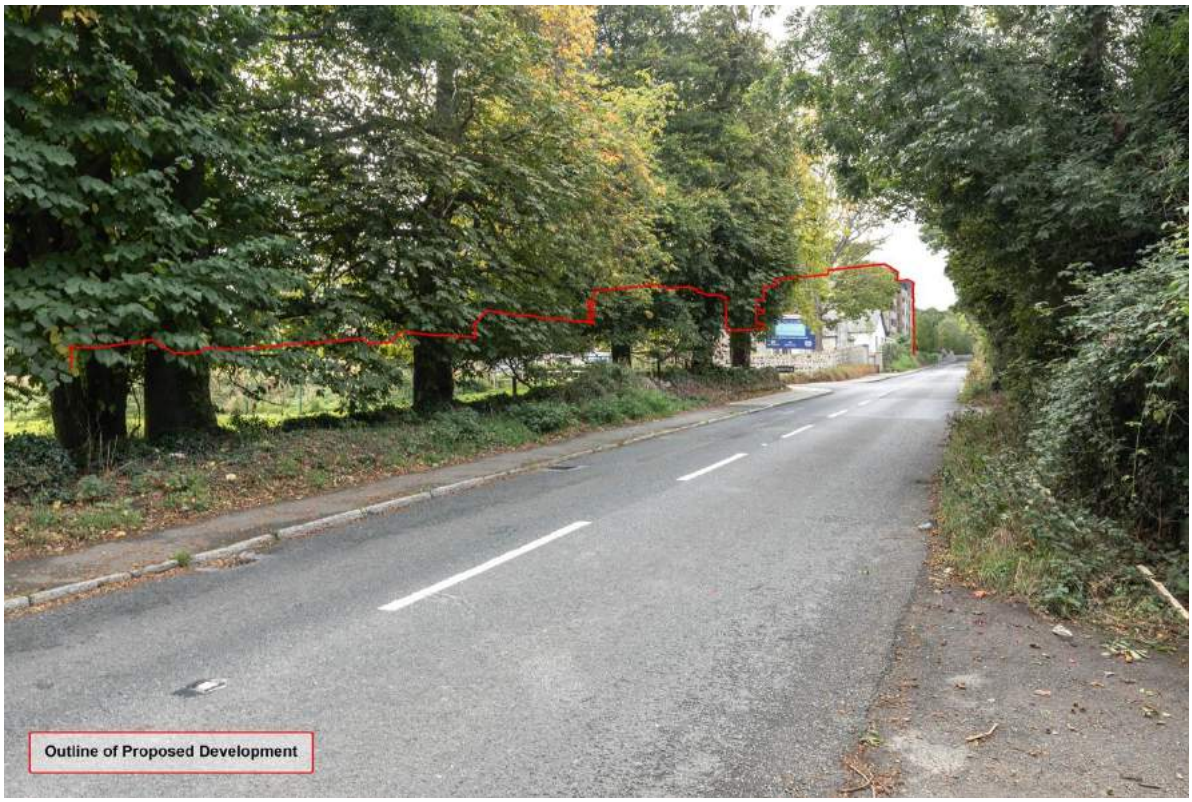

Figure 10-40 Viewpoint 12, Glenamuck Road, Proposed View

Viewpoint 12 (Figures 10-39 and 10-40)	
Location	Glenamuck Road
Coordinates	Latitude & Longitude:53.142742, -6.113493
Viewing distance to site boundary	100m
Direction of View	N
Existing View	View framed by tree hedges on both sides of the road, with the horizon line maintaining this frame. The small elevation of the terrain further contributes to the visual and physical separation of the dwellings beyond the road. The dissonant element of this view is the house closer to the road, where there is no tree barrier.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium
Magnitude of Visual Changes	Low
Duration of Effects	Medium-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor
Conclusion or Visual Impact of Proposed Development	The Proposed Development has a minor visual impact, being visible only the front of one of the proposed buildings (north front), in the background. The existing dwellings continue to have a greater visual impact since they are in front of the Proposed Development front.

- ***Viewpoint 13***

Figure 10-41 Viewpoint 13, Glenamuck Road, Existing View

Figure 10-42 Viewpoint 13, Glenamuck Road, Proposed View

Viewpoint 13 (Figures 10-41 and 10-42)	
Location	Glenamuck Road (access to Wayside Football Club)
Coordinates	Latitude & Longitude:53.143212, -6.112710
Viewing distance to site boundary	300m
Direction of View	N / NE
Existing View	The image is dominated by the presence of the high voltage poles and cables. The existing wooden fence, measuring about 90 cm, which separates *Glenamuck Road* from the terrain to the south, also captures the attention in this view. The existence of tree patches to the right (in the foreground) and to the left (in the background), create an interesting panorama, which is helped by some punctual trees in the centre of the image that will further frame the high voltage pole in the future. As described above, the housing complex that already exists in a more distant visual plan is barely perceptible, since there are also trees intersecting the dwellings.
Value of the View	Low
Visual Susceptibility	Low
Visual Sensitivity	Medium
Magnitude of Visual Changes	Low
Duration of Effects	Medium-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor to Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has a minor to imperceptible visual impact from this point of view, with only parts of the proposed higher buildings being visible. With the growth of vegetation this visual impact will tend to disappear.

- ***Viewpoint 14***

Figure 10-43 Viewpoint 14, Rockville Avenue, Existing View

Figure 10-44 Viewpoint 14, Rockville Avenue, Proposed View

Viewpoint 14 (Figures 10-43 and 10-44)	
Location	Rockville Avenue
Coordinates	Latitude & Longitude:53.142573, -6.113171
Viewing distance to site boundary	100m
Direction of View	N / NE
Existing View	View of a residential neighborhood with a central garden, recently installed, and surrounded by the road that goes around the accesses to the dwellings. The arboreal vegetation installed, in the foreground, still presents a very young size, with visibility to the background, marked by the Rockville House, a protected structure, in the centre and the already adult-size trees, most of then in Rockville House garden.
Value of the View	Medium
Visual Susceptibility	High
Visual Sensitivity	Medium
Magnitude of Visual Changes	Medium
Duration of Effects	Short to Medium-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effect	Minor to Moderate
Conclusion or Visual Impact of Proposed Development	The Proposed Development has a minor visual impact, as it is on a distant visual plan and is partially hidden by the large existing trees, most of them in Rockville House garden. However, it ends up breaking the framed view to the rustic house in the centre of the image. Considering the proposed neutral colours and the fact that the buildings have heights similar to those of the existing buildings, it allows a better insertion in this context. The development of the proposed vegetation in the northeast periphery of the Proposed Development will be important for the mitigation of this visual impact, that will disappear in the medium-term.

- ***Viewpoint 15***

Figure 10-45 Viewpoint 15, View from the Wayside Celtic Football Club, Existing View

Figure 10-46 Viewpoint 15, View from the Wayside Celtic Football Club, Proposed View

Viewpoint 15 (Figures 10-45 and 10-46)	
Location	View from the Wayside Celtic Football Club
Coordinates	Latitude & Longitude:53.142486, -6.111954
Viewing distance to site boundary	235m
Direction of View	NE
Existing View	The existing road in the foreground and the wooden fence ends up having a great visual impact from this point of view. The houses of about 2 floors and a half, which form a very homogeneous settlement, and the green structure that is divided between an herbaceous covering closer to the houses and an arboreal hedge of these houses, blend in with the hill in the background. The elements that break this homogeneity are the building of about 4 floors, with a light tone, behind the lower houses and the high voltage pole further to the left of the view. The green structure would have to be reinforced to be able to hide/adapt to these last two elements.
Value of the View	Low
Visual Susceptibility	Medium
Visual Sensitivity	High-medium
Magnitude of Visual Changes	Medium
Duration of Effects	Medium to Long-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor to Moderate
Conclusion or Visual Impact of Proposed Development	The Proposed Development ends up breaking somewhat the uniformity identified above with the existing two-story dwellings, at least the built part with greater height, hence being identified with a moderate visual impact. The natural tone foreseen for the new buildings will help to adapt better to the context of the existing buildings, better than the building that contradicts this trend identified above. The fact that this point also has a great visual scope for the site makes it more vulnerable to possible visual impacts, therefore, it is important to reinforce the peripheral vegetation on the east of the Proposed Development, to connect to the existing green structure further to the East.

- ***Viewpoint 16***

Figure 10-47 Viewpoint 16, Rockville Avenue, Existing View

Figure 10-48 Viewpoint 16, Rockville Avenue, Proposed View

Viewpoint 16 (Figures 10-47 and 10-48)	
Location	Rockville Avenue (public green area)
Coordinates	Latitude & Longitude:53.142304, -6.113171
Viewing distance to site boundary	30m
Direction of View	N / NE
Existing View	A view to a green space recently installed. The trees on this garden have not yet reached their medium/adult size. The built elements dominate this point of view, namely the dry-stone wall of about 2.5 meters and the elements behind this wall. The house on the left of this image, as it is very close to the wall, which on the garden side has a path, will always have a great visual impact from this point of view. The existing building on the far right, with about 4 floors, currently dominates this point of view but will be hidden in the future with the growth of the tree in the foreground that is on the garden side. The tree hedge that exists behind the wall helps to frame all these elements and contributes to greater harmony in this point of view.
Value of the View	Medium
Visual Susceptibility	High
Visual Sensitivity	High
Magnitude of Visual Changes	Medium
Duration of Effects	Short to Medium-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor
Conclusion or Visual Impact of Proposed Development	The Proposed Development ends up having a minor visual impact from this point of view as it appears in the continuity of the existing building, identified above. The fact of having neutral colors and an similar height to the existing building also helps to this good insertion. As also mentioned above, with the growth of the arboreal vegetation of the garden in the foreground and the arboreal vegetation proposed in the scope of the Proposed Development, this visual impact is likely to disappear.

- ***Viewpoint 17***

Figure 10-49 Viewpoint 17, Ballycorus Road, Existing View

Figure 10-50 Viewpoint 17, Ballycorus Road, Proposed View

Viewpoint 17 (Figures 10-49 and 10-50)	
Location	Ballycorus Road (close to Lasdowne FC&Old Wesley RFC)
Coordinates	Latitude & Longitude:53.14756, -6.105633
Viewing distance to site boundary	535m
Direction of View	SE
Existing View	View towards Ballycorus Road, where the tree-shrub hedge predominates on the left side and the trees on the right side, but in a more distant plan. The harmony of this view is interrupted by the presence of some heterogeneous elements, such as garages, houses and electricity poles and also the limits of properties that differ from each other in materials, textures and colors.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Conclusion or Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing dwellings and vegetation. The silhouette of the Proposed Development is represented in the image by a red line.

- ***Viewpoint 18***

Figure 10-51 Viewpoint 18, Unnamed road (near Alpine Cattery), Existing View

Figure 10-52 Viewpoint 18, Unnamed road (near Alpine Cattery), Proposed View

Viewpoint 18 (Figures 10-51 and 10-52)	
Location	Unnamed road (near Alpine Cattery)
Coordinates	Latitude & Longitude:53.14272, -6.144902
Viewing distance to site boundary	1300m
Direction of View	SW / W
Existing View	View from a road, near Alpine Cattery, to the east. The vegetation in the foreground occupies a large part of the visual angle but frames an orderly view with urban settlements surrounded by patches of vegetation and agricultural fields. The buildings in the settlements have mostly similar typologies and colours. The view is also marked by a higher area in the left part of the image, with buildings in the lower parts and vegetation on the highest parts. With a significant visual impact from this point of view, the low voltage pole and its wiring break the unity of the landscape.
Value of the View	Medium
Visual Susceptibility	High
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	Medium to High
Duration of Effects	Medium to Long-term
Quality of Effects	Neutral to Negative
Significance of Landscape and Visual Effects	Minor to Moderate
Conclusion or Visual Impact of Proposed Development	As it occupies a central position in this point of view, the Proposed Development ends up having a moderate visual impact, breaking somewhat the existing agricultural-forest landscape reading. However, as it is framed throughout its periphery by shrub-arboreal vegetation, the visual impact ends up not being so high. The fact that the volume and height of the proposed buildings are similar to the existing buildings helps to blend in with the surroundings. With the height development of the existing and proposed arboreal vegetation, the visual impact will be even smaller.

- ***Viewpoint 19***

Figure 10-53 Viewpoint 19, Three Rock Mountain, Existing View

Figure 10-54 Viewpoint 19, Three Rock Mountain, Proposed View

Viewpoint 19 (Figures 10-53 and 10-54)	
Location	Three Rock Mountain (West of Ballyedmonduff Road)
Coordinates	Latitude & Longitude:53.141337, -6.135579
Viewing distance to site boundary	2400m
Direction of View	W
Existing View	View from Three Rock Mountain to the east with a very orderly landscape and great value. Agricultural fields, on the foreplan, are separated by hedgerows. The Kilternan settlement is visible in the centre of the view and also a more densely urbanized zone on the left, but further away, part of the image.
Value of the View	High
Visual Susceptibility	High
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	Low to Medium
Duration of Effects	Medium-term
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Minor
Conclusion or Visual Impact of Proposed Development	The Proposed Development ends up having a minor visual impact on this landscape as it fits within the Kilternan settlement, not breaking the existing unity. The fact that the typologies, colors, and volumetry of the proposed buildings are similar to the existing ones also helps with this low visual impact. The proposed vegetation will help to mitigate this visual impact that is still identified, mainly from the west front of the Proposed Development.

- ***Viewpoint 20***

Figure 10-55 Viewpoint 20, R117 (close to Kilternan Parish Church), Existing View

Figure 10-56 Viewpoint 20, R117 (close to Kilternan Parish Church), Proposed View

Viewpoint 20 Figures 10-55 and 10-56)	
Location	R117 (close to Kilternan Parish Church)
Coordinates	Latitude & Longitude:53.143873, -6.115673
Viewing distance to site boundary	550m
Direction of View	NW
Existing View	View from R117 (close to Kilternan Parish Church) to the south. The road has the greatest visual range from this point of view, with the electricity poles also having a significant visual impact. A small stone wall, on the left side of the road, that separates the road from the fields to the east and another larger wall, on the right side of the road that marks the separation to *Kilternan Parish Church* grounds. Large trees, scattered and of different species, are visible in the background.
Value of the View	Medium
Visual Susceptibility	Medium
Visual Sensitivity	Medium-Low
Magnitude of Visual Changes	None
Duration of Effects	Temporary
Quality of Effects	Neutral
Significance of Landscape and Visual Effects	Imperceptible
Visual Impact of Proposed Development	The Proposed Development has no visual impact, visibility being blocked by existing and vegetation in the background. The silhouette of the Proposed Development is represented in the image by a red line.

10.5.2.5 Visual Impacts Effects Conclusion

After evaluating the visual impact on these 20 points, the Table 10-13 summarizes 3 of these criteria (Duration, Quality and Significance).

Table 10-15 Visual Impact Assessment Results

Duration of the Effects	Viewpoints	Total	%
Permanent	_	0	0%
Long-term to Permanent	7	1	5%
Long-term	8	1	5%
Medium to Long-term	4, 6, 15, 18	4	20%
Medium-term	12, 13, 19	3	15%
Short to Medium-term	14, 16	2	10%
Short-term	–	0	0%
Temporary	1, 2, 3, 5, 9, 10, 11, 17, 20	9	45%
Quality of the Effects			
Beneficial	_	0	0%
Neutral to Beneficial	6	1	5%
Neutral	1, 2, 3, 5, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20	15	75%
Neutral to Negative	4, 7, 8, 18	4	20%
Negative	_	0	0%
Significance of Landscape and Visual Effects			
Imperceptible	1, 2, 3, 5, 9, 10, 11, 17, 20	9	45%
Minor to Imperceptible	13	1	15%
Minor	12, 16, 19	3	15%
Minor to Moderate	14, 15, 18	3	15%
Moderate	4	1	5%
Moderate to Significant	6, 8	2	10%
Significant	7	1	5%
Profound	_	_	0%

It is concluded that in 45% of these points the visual impacts from the Proposed Development will be temporary, 5% in the long-term and 5% will be permanent, this last set corresponding only at 10% of the total points considered.

With regard to quality, 75% of the points are considered neutral, with only 20% being neutral to negative, 0% negative and 5% neutral to beneficial.

Finally, 45% of the points are considered to have an imperceptible impact and 30% a set that corresponds to the minor or minor to moderate impact. Only 10% are considered to have a moderate to significant impact and 5% to have a significant impact.

In the viewpoints considered as having a significant, neutral to negative and long-term to permanent impact, it will be important to understand what mitigation measures could be adopted in addition to those already foreseen in the project. Many of these measures involve the implementation and development of the green elements proposed with the project, which is of particular importance when considering these viewpoints. Therefore, special attention should be given to this green structure, taking into account the measures for installing the vegetation and the possibility of using plants with a larger size, and with more volume, so the mitigating effect can be more efficient.

10.5.3 Daylight and Sunlight assessment

3D Design Bureau carried out a detailed BRE daylight and sunlight assessment, along with an accompanying shadow study for the Proposed Development.

Figure 10-57: Scope of surrounding properties and environment assessed

The impact assessment that was carried out for the purpose of the report has studied the potential levels of effect the surrounding existing environment and/or properties would sustain should the Proposed Development be built as proposed.

10.5.3.1 Analysis of Impact Assessment Results

- **Effect on Vertical Sky Component (VSC)**

The effect on VSC has been assessed for 57 No. windows/rooms across the surrounding properties, namely 5-6 Cromlech Close, 7-13 Rockville Woods, Rockville Hall apartments, 10-14 Rockville Avenue and Rockville Mews. The effect to VSC on 43 no. of these windows (or rooms if an average of multiple windows has been taken) would be considered imperceptible, 6 no. not significant and 8 no. slight. This shows that ~75% of the assessed windows will experience an imperceptible level of effect. Each instance of non-compliance with the BRE

recommendations regarding impact to VSC is located along Rockville Woods and on the Rockville Hall Apartments.

The affected windows along 7-13 Rockville Woods, are all on the ground floor and appear to be living room windows with a generous glass to floor ratio (~26%). The BRE Guidelines state that if a VSC of a window is between 15% and 27%, then special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight. As the proposed VSC values on the ground floor windows of 7-13 Rockville Woods are all well within this range (22.38%-26.29%), these living rooms would likely still receive adequate levels of daylight despite a perceptible reduction.

The LKDs also have windows that are notably close to the shared site boundary as well as windows facing north-west or south east respectably. The windows that are facing the Proposed Development, close to the shared site boundary, have a large balcony directly above. The effect to the windows located underneath balconies that are located so close to the shared site boundaries would receive a perceptible level of effect to daylight. Although, the affect on these windows is relevantly high, the effect on the unit as a whole is reduced by the fact that the LKDs are dual aspect and are capable of receiving light from other windows to which there is significantly less reduction coming from the Proposed Development.

- **Effect on Annual/Winter Probable Sunlight Hours (APSH/WPSH)**

The APSH/WPSH assessment has been carried out on the same windows as the VSC study with the exception of the windows to the rear of Cromlech Close and the windows of Rockville Mews, which have not been included on the basis that these windows do not have an orientation within 90 degrees of due south. In total, the effect on APSH has been assessed for 51 no. of windows/rooms of the surrounding existing properties. The effect on the APSH of 50 no. of these windows or rooms would be considered imperceptible with the remaining 1 no. being categorised as not significant. The effect on WPSH has been assessed for the same 51 windows of the surrounding existing properties across as per the APSH study. The effect on the WPSH of 50 no. of these windows would be considered imperceptible, and 1 no. not significant.

The room of Rockville Hall has not met the BRE criteria for impact on APSH and WPSH respectively. It should be noted that the windows to the rear of Rockville Hall, situated close to the boundary and underneath balconies would receive a greater level of Affect to APSH and WPSH, but as the calculation to these units is carried out on the room as opposed to on individual windows. This is the case for 0a#, as stated above, however as the secondary windows of this unit are both at a lower level and do not have a favourable orientation the additional windows were not enough to prevent this room from falling marginally below BRE compliance. Window 7a on Rockville Woods has a WPSH (4.9%) that is marginally below the recommended minimum as per the BRE Guidelines (5.0%). It should be noted that this window would experience an imperceptible level of effect to the annual sun (APSH).

- **Effect on Sun On Ground in Existing Gardens**

This study has assessed the effect the Proposed Development would have on the level of sunlight on March 21st in the rear gardens/amenity areas of the neighbouring properties,

namely 5-6 Cromlech Close, Rockville Walled Garden, 4-7 Rockville Court and 10-14 Rockville Avenue.

In total 12 no. spaces have been assessed. All assessed spaces would experience an imperceptible level of effect. The vast majority of assessed spaces would not receive any reduction to the area capable of receiving 2 hours or more of direct sunlight on March 21st. No assessment was carried out on the impact the proposed scheme would have on the gardens of the properties along Ballycorus Road and Enniskerry Road on the basis of orientation and/or proximity. However, the 2 hour false colour plan shows that any reduction to the portion of these gardens capable of receiving 2 hours of sunlight on March 21st would be negligible.

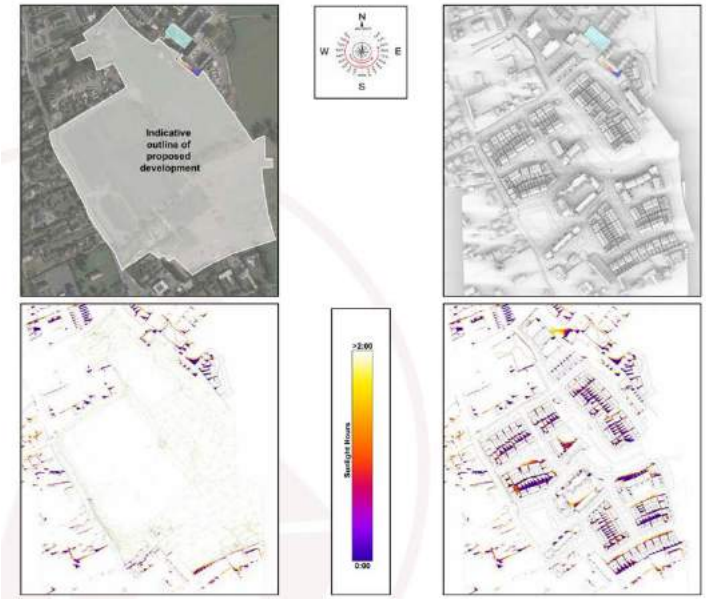

Figure 10-58: False coulours plans. White areas indicates the area capable of receiving 2 hours of sunlight on March 21st (Proposed)

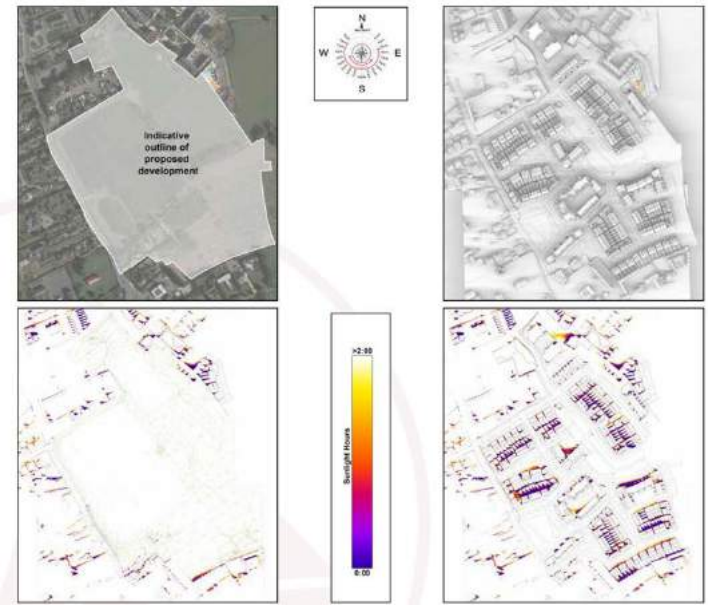

Figure 10-59: False coulours plans. White areas indicates the area capable of receiving 2 hours of sunlight on March 21st (Proposed)

10.5.3.2 Analysis of Scheme Performance Results

- **Sun On Ground in Proposed Public and Communal Open Spaces**

The study has assessed the level of sunlight on March 21st with in the proposed public and communal open spaces as identified by the project landscape architect, Rónán MacDiarmada & Associates Ltd. In total 18 No. spaces have been assessed, 17 No. of which would meet the criteria as set out in the BRE Guidelines.

The only space that did not meet the recommended minimum level of sunlight on March 21st is the communal space to the rear of Duplex A2. This is due to the orientation of this amenity space which is located to the north of Duplex A2. However, each property within Duplex A2 has a private amenity area capable of receiving the recommended minimum level of sunlight. The other 17 assessed public and communal open areas all perform very well in this assessment with more than 90% of each space capable of 2 hours of sunlight on March 21st.

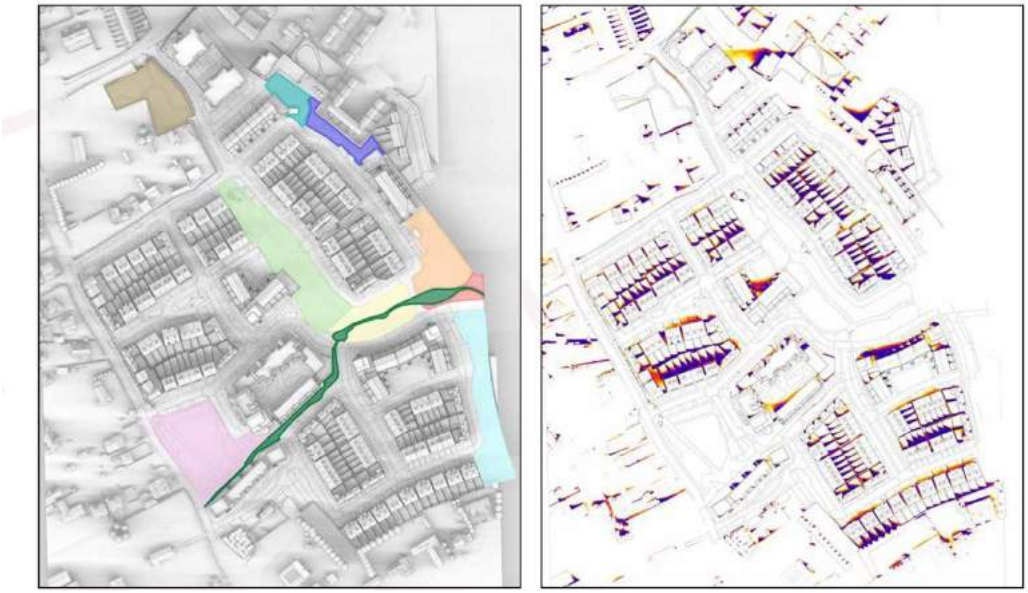

Figure 10-60: Indication of the public amenity areas that have been assessed (L).Area capable of receiving 2 hours of sunlight on March 21st shown in white (R)

- **Sunlighting in Proposed Private Amenity Spaces**

This study has assessed the level of sunlight on March 21st with in the proposed private amenity spaces, such as balconies and terraces, for the proposed duplex and apartment units. In total 253 No. spaces have been assessed, 201 No. of which would meet the criteria as set out in the BRE Guidelines. This gives a compliance rate of circa 79%. It should be noted that a high level of compliance in this study is extremely unlikely as balconies/terraces located on the north facade cannot achieve compliance in this regard. As such, the compliance rate of ~79% for this study should be considered as a favourable outcome.

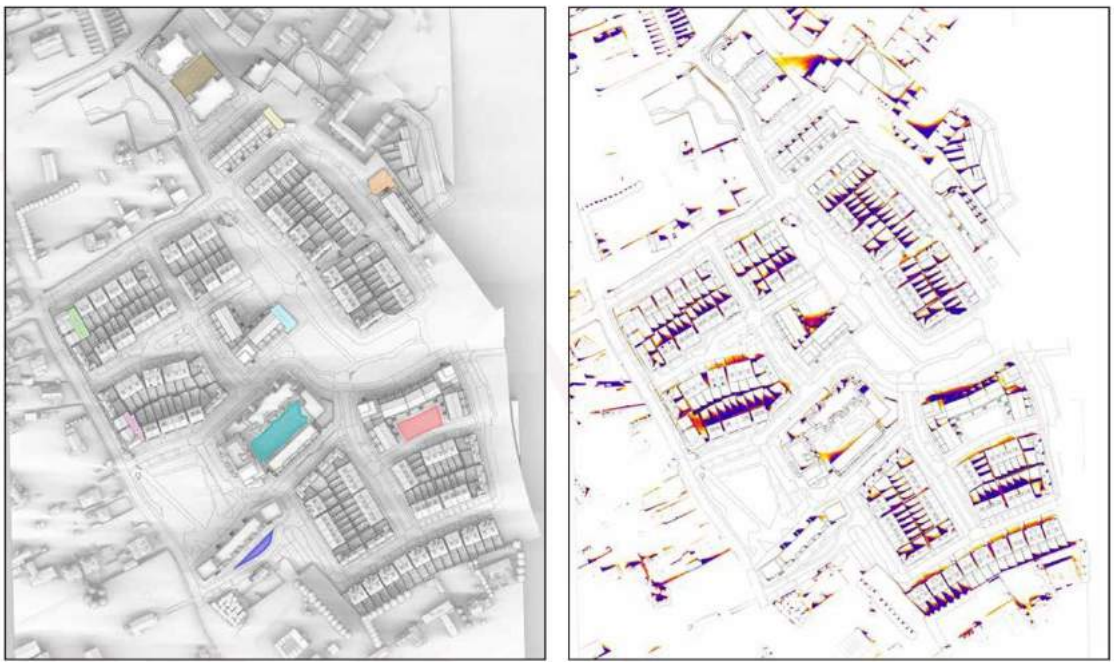

Figure 10-61: Indication of the private amenity areas that have been assessed (L).Area capable of receiving 2 hours of sunlight on March 21st shown in white (R)

10.5.3.3 Final considerations

This assessment has studied the effect the Proposed Development would have on the level of daylight and sunlight received by the neighbouring residential properties that are in close proximity to the Proposed Development. That the majority of which would receive an imperceptible level of effect is evidence of the Proposed Development having adequate separation from the surrounding properties.

The Proposed Development will be capable of receiving excellent levels of sunlight throughout the proposed public open spaces with the vast majority of communal and private amenity areas also receiving sufficient levels of sunlight.

Finally, an excellent of compliance has been achieved regarding the internal daylight of the proposed duplex and apartment units.

10.5.4 Conclusion

This Chapter has related the Landscape Impact Assessment (LIA) and the Visual Impact Assessment (VIA) in respect of a Strategic Housing Development at this 11.2 Ha site at lands at Wayside, Enniskerry Road, Kilternan, Dublin 18.

The Site is currently predominately greenfield and includes a 0.35 Ha derelict farmyard area. The Proposed Development site is surrounded by a fragmented pattern of low density-built fabric comprising low-rise housing and cottages against the backdrop of the Dublin mountains. Hedgerows were identified on the north and south borders of the property, with the most

important hedgerow being located in the centre of the property. The western and eastern limits of the site have no tree or shrub vegetation, with only some spontaneous shrub-vegetation along the western wall.

The site of the Proposed Development was considered to have a Medium Landscape Value, a Medium Landscape Susceptibility, a Medium to High-Medium Landscape Sensitivity and that the Proposed Development changes to landscape characteristics are Medium. In terms of the LIA some significant changes will occur on the landscape of the site, mainly with the removal of trees and hedgerows and general construction activity to the implementation of the proposed buildings, but these changes will also be counterbalanced with the implementation of the new green structure and maintenance of some of the most important hedgerows.

In what refers to the VIA, 20 viewpoints were assessed, chosen by sensitivity of the views trough site visits and Viewshed's analysis. As it can be seen by the conclusion on the visual effects (Chapter 10.5.2.5) the visual impacts of the Proposed Development are limited to the viewpoints in closer areas of the Site that didn't have a natural or physical barrier in the existing situation – namely the western front. The typology of buildings adapts well to the existing environment by linking to existing buildings of the similar typology. The new plantings planned for the peripheral zones of the Proposed Development and the creation of amenities zones in central spaces of the site will manage to mitigate the visual impacts caused in the medium term.

10.5.5 Potential Cumulative Impacts

Cumulative impacts can be described as impacts that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.

Given the zoning of the adjoining lands it is reasonable to expect additional development in close proximity. There are several areas north and east of the Proposed Development site that are zoned as "*Medium Density Residential*" and also other areas west of the Site zoned as "*Lower Density Residential*" in the Dun Laoghaire County Development Plan 2022-2028.

The "*Glenamuck Link Distributor Road*", proposed outside the East periphery of the Proposed Development, will link to the proposed *Glenamuck District Distributor Road* and is expected to have a significant landscape and visual impact since it will create a barrier between the two existing recreational amenity areas and the greenway inside the Proposed Development that will link to the High Amenity area, further East.

10.5.6 "Do Nothing" Impact

The do-nothing impact refers to the non-implementation of the Proposed Development. The primary effect of this would be that the impacts and effects identified would not directly occur. In the event that the development does not proceed it is very likely that the Proposed Development site would be developed in the future in line with its zoning. If the site is left in its current state, it will be likely continued to be maintained in its current manner and hence a neutral impact will persist on the existing landscape.

10.6 Avoidance, Remedial & Mitigation Measures

The key landscape and visual mitigation measures used during the Construction Phase have been incorporated into the layout of the site and design of the proposed buildings. The buildings will be low height (2-5 storeys), clad in a similar neutral colored material and will have a similar horizontal emphasis.

The measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the Site is kept tidy, dust is kept to a minimum, and that any locations close to public areas are kept free from building material and site rubbish.

Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound(s) and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

For those trees proposed for retention, all necessary mitigation measures will be put in place in order to prevent or reduce impact to its very minimum. Mitigation measures used will need to include the erection of protective fencing at the very start of the works, ground protection installation within root zones where fencing cannot be erected to enclose the entire root zones, monitoring of the site works by the project Arboriculturist throughout the construction process and the use of tree friendly techniques and products for the construction process.

10.6.1 "Worst Case" Scenario

The worst-case effects arise when the mitigation measures as proposed substantially fail. This would result in landscape and visual impacts lasting in the medium to long term as due to the location of the Proposed Development on valuable zone land it would be highly likely that it would be redeveloped in the near future.

The failure of the proposed landscape mitigation measures is very unlikely. Also, if the Proposed Development is granted, the proposed landscaping will become a part of the plans and particulars of the planning application and as such can be made subject of an enforcement notice by the local authority to rectify the situation.

10.7 Residual Impacts

Residual Impacts are defined as '*effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining '*environmental costs'* of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment. No negative residual impacts in

the context of landscape and visual impact are anticipated regarding this Proposed Development.

10.7.1 Construction Phase

Notwithstanding the proposed ameliorative and mitigation measures proposed during the Construction Phase, it is considered that the initial development of the site, including removal of trees and hedgerows and general construction activity will result in overall residual effects that are moderate, negative temporary impacts and ongoing residual effects that will be moderate, neutral short-term impacts by the closest receptors and reduce rapidly with distance to impacts which are minor/negligible, neutral short term impacts.

10.7.2 Operational Phase

On completion, the disturbance and change associated with the construction stage will be gradually altered by the influence that the new development establishes on the character and visual context of its environs. In this regard it is considered that the Proposed Development of the site will have a residual minor local impact on the landscape character of its environs and reduce rapidly with distance to impacts which are negligible, neutral long-term impacts.

10.8 Monitoring

10.8.1 Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect. The planting works will be undertaken in the planting season after completion of the main civil engineering and building work.

Any construction works within close proximity to retained trees are advised to be undertaken in accordance with approved method statements prepared by the construction contractor under the direct supervision of a qualified consultant Arboriculturist. Therefore, during the construction works, a professionally qualified Arboriculturist is recommended to be retained by the principal contractor or site manager to monitor and advice on any works within the RPA of retained trees to ensure successful tree retention and planning compliance. The Arboriculturist is to make regular site visits to ensure that the tree protection measures are in place and adhered to.

10.8.2 Operational Phase

Monitoring of the mitigation measures will form part of the landscape management plan. Replacement trees, replacement planting and pruning measures will be captured in landscape maintenance plans, and are intrinsically linked to the proposed mitigation measures. All landscape works will be in an establishment phase for the initial three years from planting. A landscape maintenance plan accompanies the planning application. Prior to completion of the landscape works, a competent landscape contractor will be engaged and a detailed maintenance plan, scope of operation and methodology will be put in place.

10.9 Interactions

Interactions between Landscape and Visual Impact and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

10.9.1 Population and Human Health

It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the site of the Proposed Development and the suburban village and residential nature of the surrounding landscape, will cause any issues for the residential local population.

10.9.2 Biodiversity

The proposed landscaping of the Site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the Site. The landscaping proposals will entail losses and contributions in terms of vegetation at the Site, which in turn will affect the ecology of the Site. The Site in its current condition is not of high ecological value, and the proposed landscaping will not result in significant adverse effects in this regard.

It is noted that the Proposed Development further negates any habitat loss through the provision of a number of planted garden areas and green roofing included in the project design. As such, no significant cumulative habitat loss will occur involving the Proposed Development.

10.9.3 Archaeology and Cultural Heritage

As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.

10.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter.

10.11 References

Dún Laoghaire-Rathdown County Development Plan 2022-2028

The Landscape Institute, 'Guidelines for Landscape and Visual Impact Assessment', (3rd Edition) 2013

Technical Information Note on Townscape Character Assessment, 2016, published by the Landscape Institute

'The Countryside Agency and Scottish Natural Heritage – Landscape Character Assessment Guidance for England and Scotland' 2002

Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Statement (2022)

EPA Advice notes on current practice in the preparation of environment impact statements (2003)

EPA - Environmental Management Guidelines - Environmental Management in the Extractive Industry

Section 177F of the Planning and Development Act 2000 (as amended)

A Handbook on Environmental Impact Assessment, Scottish Natural Heritage

Journal of Environmental Psychology, Visual Thresholds for Detection, Recognition and Visual Impact in Landscape Settings (H. Shang and I.D. Bishop, 2000)

Landscape design with plants, Brian Clouston

Atlas of the Irish rural landscape, Aalen, Whelen, Stout

11 ARCHAEOLOGY AND CULTURAL HERITAGE

11.1 Introduction

This Chapter of the EIAR describes and assesses the potential effects of the Proposed Development, located at lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18 and was prepared by Laura Griffin, Environmental Consultant with Enviroguide Consulting.

The Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

The aim of this Chapter is to assess the baseline Archaeological, Architectural and Cultural Heritage conditions of the surrounding environment for the Proposed Development, in order to determine any significant impacts that may arise as a result of the Proposed Development and highlight any potential effects this may have on these resources. In addition, if deemed appropriate, mitigation measures are recommended, in accordance with the policies of Dun Laoghaire Rathdown County Council, the Department of Culture, Heritage and the Gaeltacht, National Monuments Acts 1930-2004 and best practice guidelines.

The assessment comprises a paper survey and cartographic research. The sources used were the Record of Monument and Places (RMP), Department of Culture, Heritage and the Gaeltacht (DoCHG), the National Museum of Ireland topographical files, the county Development plan and Kilternan LAP and various literature resources.

The RMP is comprised of manuals listing all known archaeological sites and monuments in each county with accompanying maps locating these sites and additional information from archaeological excavations and assessment records in the intervening period. All sites included in the RMP are protected under the National Monuments Acts (1930-2004). The record is continually updated with information from the results of on-going research and excavation, as new sites are discovered. The types of Recorded National Monuments, both within the study area and in the immediate vicinity, have served to inform the author in the development of a hypothesis as to the potential sub-surface archaeology within the study area. This is backed up by the results of previous archaeological excavations and investigations both within and without the study area published in excavation summary reports for each year (www.excavations.ie).

The National Museum maintains a register of finds of archaeological objects from each townland in the twenty-six counties of the Republic of Ireland. Detailed records are held for each find, many of which are regarded as 'stray finds' having been recovered by farmers in the course of ploughing or other such activities and received to the museum in accordance

with national monuments legislation. The records contain information such as type and location of find, correspondence between the museum and the finder, and, where applicable, results of excavations carried out by museum staff at the location of the finds.

The Dun-Laoghaire Rathdown County Development Plan (2022-2028) has a list of protected structures which has established the preservation of these structures including their settings. The Record of Protected Structures was established under the Local Government (Planning and Development) Act 2000 and comprises a listing of structures of architectural, historical, archaeological, artistic, cultural, scientific, social, or technical interest, along with accompanying maps.

A number of literary sources and Cartographic maps were also consulted. Literary sources are a valuable means of completing the written archaeological record of an area and gaining insight into the history of the environs of the proposed works. The principal sources consulted are listed in the References at the end of this Chapter. Cartographic maps consulted were the OS 6-inch first edition mapping (1837-1842), 25-inch mapping series (1889-1913) and third edition (1909) for Co. Dublin.

11.2 Study Methodology

11.2.1 Guidance and Legislation

The following legislation and guidance documents were consulted as part of this assessment. This legislation makes up the main legal mechanisms by which Archaeological, Architectural and Cultural Heritage resources are protected in Ireland.

- National Monuments Act, 1930-2014;
- Heritage Act, 1995;
- Architectural Heritage and Historic Properties Act, 1999;
- Local Government (Planning and Development) Act, 2000, as amended
- The Planning and Development (Strategic Infrastructure) Act, 2006;
- EPA 'Advice Notes for preparing Environmental Impact Statements' (Draft 2015);
- EPA ‘Guidelines on the Information to be Contained in Environmental Impact Statements’ (EPA, 2022);
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands.
- Architectural Heritage Protection: Guidelines for Planning Authorities, 2011, (formerly) Department of Arts, Heritage, and the Gaeltacht.

The assessment contained in this Chapter involved a desktop study / paper survey which considered all available archaeological, architectural, historical, and cartographic sources. This information was used in order to assess any potential impact on the receiving environment and to identify measures to ensure the conservation of any monuments or features.

11.2.2 Desk Study

The following archaeological, historical and cartographic sources were examined as part of the paper study:

Records of Monuments and Places (RMP) is a list of monuments recorded under Section 12 (1) of the National Monuments (Amendment) Act 1994.

Sites and Monuments Record (SMR) is a national baseline database of known archaeological sites and monuments in Ireland.

Topographical Files of the National Museum of Ireland is an archive containing records of all finds logged by the National Museum.

Aerial Photographs provide an important archaeological resource in terms of detecting new sites and identifying the exact location and extent of known sites. These features can be identified through surface anomalies such as earthworks or distinct vegetation marks.

Excavations Bulletin is an annual publication, started in 1970, which summarises all archaeological excavations carried out in Ireland each year (www.excavations.ie).

The National Inventory of Architectural Heritage is a comprehensive database of structures relating to the architectural heritage of Ireland.

Dun Laoghaire Rathdown County Development Plan contains a list of Architectural Conservation Areas and recorded Protected Structures for Dun Laoghaire Rathdown.

Cartographic Sources are important in providing topographical information on areas of archaeological potential as well as tracing land use development within the Proposed Development area.

11.3 The Existing and Receiving Environment (Baseline Situation)

The subject site is a 11.2 hectare site and is located at lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18. The Site is currently predominately greenfield and includes a 0.35Ha derelict area with outbuildings

The surrounding area is predominantly residential and agricultural. The Site is generally bounded by the Glenamuck Road to the north; hedgerows/trees and the Kilternan Country Market and the Sancta Maria property to the north-west; an existing stone wall and the recently constructed residential development named "Rockville" to the north-east; a 1.2m high existing stone wall and the Enniskerry Road to the south-west; dwellings to the south; and open green field lands that will facilitate the future Glenamuck Link Distributor Road to the east. Part of the Site's frontage lies directly opposite Our Lady of the Wayside Church, Kilternan. The lands are located 1.9 km to the south-west of the M50 and Carrickmines Retail Park.

Ringforts and enclosures are undoubtedly the most common field monuments within the Irish landscape and there are no. 3 ringforts and no. 7 enclosures located within a 2km radius of the Proposed Development. A ringfort is a space surrounded by an earthen bank formed by material thrown up from a fosse or ditch located immediately outside the earthen bank. Generally, ringforts vary in size from 25–50 metres in diameter and are usually circular in plan but can also be oval or D-shaped. Figure 11-1 indicates the location of the Proposed Development in relation to archaeological monuments and architectural features.

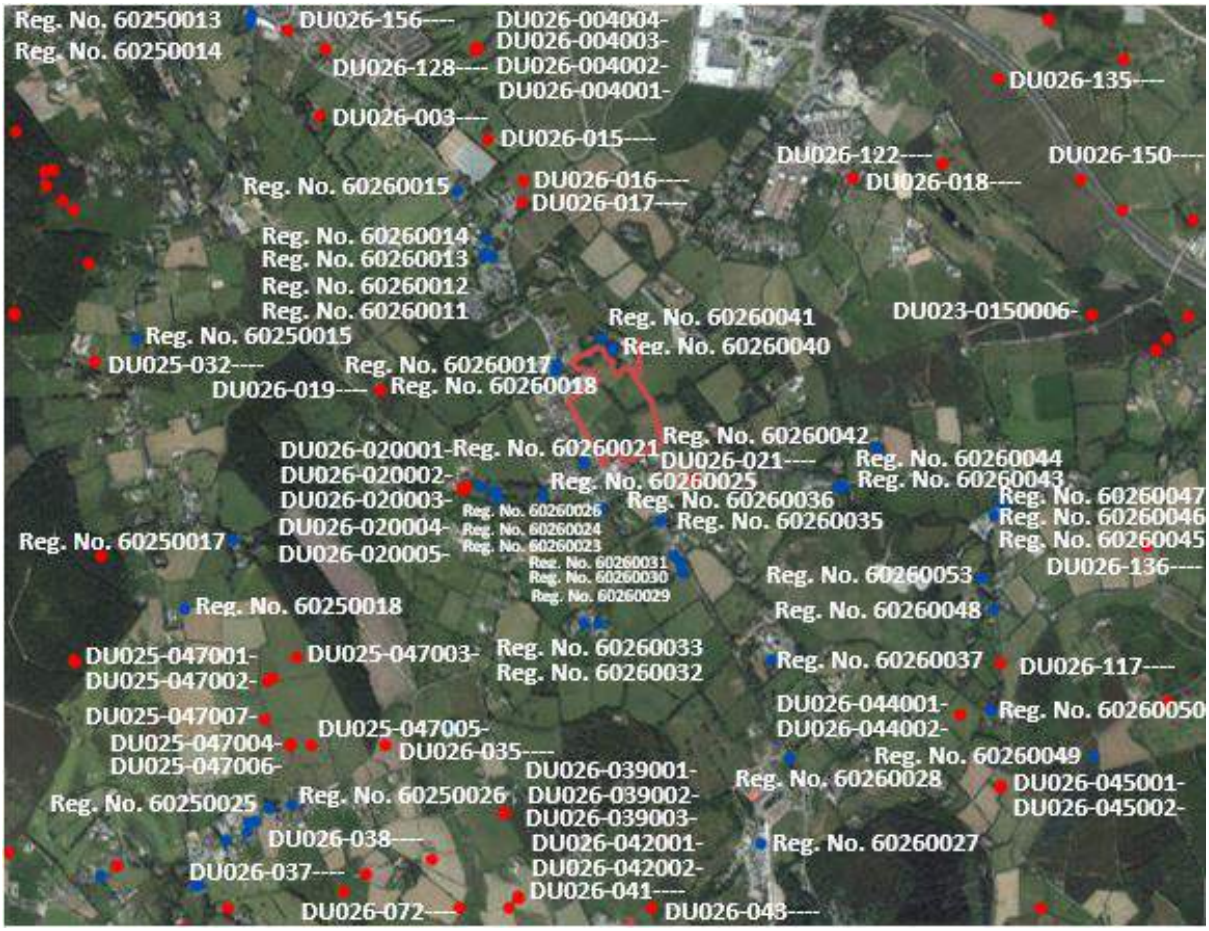

Figure 11-1: Location of Proposed Development (red line boundary) in relation to archaeological monuments and architectural features (red and blue dots)

11.4 Characteristics of the Proposed Development

The Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

11.4.1 RMP files (Record of Monuments and Places) close to the study area

Within a 2km radius of the development Site there are forty-six recorded archaeological monuments. The monuments are listed below, and identified by townland, RMP number, site type, site status and distance of the site for the Proposed Development. The RMP reference consists of a three-letter county code, the relevant number of the Ordnance Survey six-inch sheet on which the Site is located, and the number of the individual monument. This information is gathered from the online Historic Environment Viewer provided by the Department of Culture, Heritage, and the Gaeltacht. These monuments are discussed below

within the context of the historical and archaeological background of the surrounding area. No Recorded Monuments will be affected by the Proposed Development.

RMP No. DU026-021----

Townland Glenamuck South, Kingston (Rathdown By., Ballybrack ED)

Site Type Enclosure

Description A sketch accompanying the OS Letters (1837) shows a cluster of enclosures at Glenamuck (Herity 2001, 20). The enclosures were located in level pasture on the N bank of stream overlooked by the tower at Ballycorus (DU026-044001-). There is no visible trace at ground level.

Distance This RMP site is located 0.2km south of the Proposed Development Site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-020003-

Townland Kilternan

Site Type Font

Description The church stands within a walled graveyard, located on the summit of a S facing slope. A granite font sits in the E window embrasure of the medieval church (DU026-020002-). The font is round, flat-bottomed with a funnel shaped interior (H 0.30m, max. Wth, 0.59m).

Distance This RMP site is located 0.6km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-020001-

Townland Kilternan

Site Type Church

Description The church stands within a walled graveyard, located on the summit of a S facing slope. There is a curve in the NE section of the boundary wall, which may indicate the previous existence of an early ecclesiastical enclosure. This is a plain rectangular building (L 10.6m, Wth 5.5m, Wall T. 0.74m-0.90m) built of randomly coursed granite blocks; there are larger blocks used in the lower courses of the building. The corner quoins are dressed. The E and

W gables are still standing; the upper portion of the E gable wall is narrower creating a ledge. There is a stepped entrance in the E end of N wall (Wth 1, 63m). Levels have risen outside the church, burying the lower portion of the building.

A round-headed E window is formed from dressed granite and is set into a deep, widely - splayed embrasure. There is a lintelled doorway centred in the W gable (H 1.43m)(Now blocked) (H 0.82m, Wth 0.12m) and a partially blocked pointed doorway in the S wall (H 1.02m, Wth 1.70m). The external wall has been buttressed. A granite font sits in the E window embrasure. This is round, flat-bottomed with a funnel shaped interior (H 0.30m, max. Wth, 0.59m). A cross-incised granite slab lies outside the SE corner of the building (L 0.45m, Wth 0.46m, T. 0.12m). (Pers. comm. Chris Corlett). (Wakeman 1891, 697-702; 1900, 188-190; Turner 1983, 46).

Distance This RMP site is located 0.6km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-020005-

Townland Kilternan

Site Type Cross-slab

Description YA cross-incised granite slab lies outside the SE corner of the church (DU026-0001-) (L 0.45m, Wth 0.46m, T. 0.12m) (Pers. comm. Chris Corlett). (Wakeman 1891, 697-702; 1900, 188-190; Turner 1983, 46, Corlett & Mc Guinness 1994, 217-8, Swords, 2009, 99). The church stands within a walled graveyard, located on the summit of a S facing slope

Distance This RMP site is located 0.6km west of the Proposed Development Site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-020002-

Townland Kilternan

Site Type Graveyard

Description The church (DU026-020001-) stands within a walled graveyard, located on the summit of a S facing slope. There is a curve in the NE section of the boundary wall, which may indicate the previous existence of an early ecclesiastical enclosure (Wakeman 1891, 697-702; 1900, 188-190; Turner 1983, 46).

Distance This RMP site is located 0.6km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-020004-

Townland Kilternan

Site Type Ringfort – cashel

Description Situated on a S-facing, furze-covered slope above Glencullen village. A ringfort comprising of a circular sunken area (int. diam.23m) enclosed by a drystone wall (Wth 1.5m; H 0.6m) which rises to three courses and an external fosse (Wth 2m; D 0.5m). The interior is divided into two compartments by a curving wall. There are furze-covered hut sites in the N half. The entrance (Wth 5m) is in the SE. A series of curving field walls radiate from the W and SE of site (Herity 2001, 22-4). Recent aerial coverage of the area (OS 10:4735) shows a system of irregular fields extending into both the remaining unimproved pasture onthe hill and the improved pasture N of the cashel.

Distance This RMP site is located 0.6km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-019----

Townland Kilternan Domain

Site Type Megalithic tomb – portal tomb

Description This portal tomb is located on a SW-facing slope in rock-strewn pasture. In recent years there has been considerable land clearance in its immediate environs. Two portal-stones, which are angled forwards to the W, and a blocking stone form the entrance to a long rectangular chamber (L 4.5m; Wth 2.6m; H 1.25m). The capstone is massive (L 6.5m; Wth 5.3m; D 1.55m) thickest at the leading edge and sloping sharply to a ground-fast rear stone at E. The chamber, which opens to the W was briefly excavated by Marcus Ó hEochaidhe, who found a chert arrowhead, three hollow scrapers and an end scraper - all tools diagnostic of the Early Neolithic period (Corlett 2012; Herity 1964, 134-9; O'Neill 1852 42; Ó Nualláin 1983, 82, 96; Turner 1983, 6;).

This monument was subject to a preservation order made under the National Monuments Acts 1930 to 2014 (PO no. 47/1936) and was subsequently taken into Guardianship under the National Monuments Acts 1930 to 2014 (National Monument 343).

Distance This RMP site is located 0.8km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU025-032----

Townland Ballyedmonduff

Site Type Redundant record

Description Situated in improved pasture on the S slopes of Three Rock Mountain. An enclosure marked as circular in plan with a gap in the E on the 1843 OS 6-inch map. (int. diam. c. 17m). According to Healy (1975, 1-19) it had been removed since.

Distance This RMP site is located 2km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-017----

Townland Jamestown (Rathdown By.)

Site Type Designed landscape – tree-ring

Description This site is located in a low lying heavily landscaped area. A removed ring feature thought to be a tree ring (Healy 1975).

Distance This RMP site is located 0.7km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-016----

Townland Jamestown (Rathdown By.)

Site Type Designed landscape – tree-ring

Description This site is located in a low lying heavily landscaped area. There were two ring features, now removed, which are thought to be tree rings (Healy 1975).

Distance This RMP site is located 0.8km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-015----

Townland Jamestown (Rathdown By.)

Site Type Cist

Description This site is located in a low lying area and is located on the landscaped grounds of Stepaside Golf course. A cist burial was found during sand-quarrying operations. The burial was accompanied by a Food Vessel (NMI 1927:45; 1927:64). Two other burials were found nearby, one an inhumation accompanied by a Food Vessel contained in a cist. The second, a cremation, was associated with a Food Vessel (Kavanagh 1973, 545-6, Waddell 1970, 116).

Distance This RMP site is located 0.9km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-117----

Townland Ballycorus

Site Type Mining complex

Description The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded.

Distance This RMP site is located 1.7km south east of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-044001-

Townland Ballycorus

Site Type Castle – tower house

Description The site of tower house is located on the lower NW slopes of Carrickgollogan overlooking the Loughlinstown river valley. A manuscript map accompanying the OS Memoranda shows a rectangular plan of a building and the monument is depicted on the First OS 6 inch map as a rectangular structure with divided by an internal wall. It is shown on the Down Survey (1655-6) map as a tower house. Described as a castle in the Civil survey (1654-6) the proprietor of which died a half year before the Rebellion (Simington 1945, 275). The Down Survey (1655-6) map also shows a dwelling beside the castle. It had been argued that was the 'large hall' mentioned in the Civil Survey (Simington 1945, 275), but it has since been established that this was a misreading of the reference which in fact refers to Shanganagh Castle (DU026-120----) and not to Ballycorus. There are no visible traces of this site above ground.

Distance This RMP site is located 1.7km south of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-044002-

Townland Ballycorus

Site Type Redundant record

Description This recorded was formerly classed as 'Castle - hall house' and the source was a mis-reading of a reference in Simmington (1945, 275) which refers to a large thatched hall: this relates to Shanganagh Castle (DU026-120----) and not to Ballycorus.

Distance This RMP site is located 1.7km south of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-045001-

Townland Ballycorus

Site Type Ringfort – unclassified

Description The site is situated on the lower NW slopes of Carrickgollogan Mountain overlooking Loughlinstown river valley. The 1843 OS 6-inch map shows an enclosure (diam. c. 25m) with linear earthworks to the NW of it. A sketch plan in the OS Memoranda appears to depict a ringfort with associated field system (O'Flanagan, 1927, 39-40). It is not visible at ground level.

Distance This RMP site is located 2km south of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-045002-

Townland Ballycorus

Site Type Field system

Description The field system is situated on the lower NW slopes of Carrickgollogan Mountain overlooking Loughlinstown river valley. The 1843 OS 6-inch map shows linear earthworks associated with a ringfort. A sketch plan in the OS Memoranda appears to depict a ringfort with associated field system (O'Flanagan, 1927, 39-40). The site is not visible at ground level.

Distance This RMP site is located 2km south of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-043----

Townland Ballybetagh

Site Type Enclosure

Description The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded.

Distance This RMP site is located 1.9km south of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-039001-

Townland Ballybetagh

Site Type Cairn – unclassified

Description This was a cairn of stones (diam. 12m) which was removed in the 1960s. It was located on what is reclaimed pasture which falls SE to the Glencullen River Valley (Healy 1975, 1-19). There are no visible remains of this cairn.

Distance This RMP site is located 1.6km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-039003-

Townland Ballybetagh

Site Type Ringfort – unclassified

Description This ringfort is situated on a SE-facing slope above the Glencullen River and shown on the 1843 OS 6-inch map. It is a circular enclosure (ext. diam. 11m) defined by an enclosing drystone bank (Wth 1.84m; H 1m). The entrance was on the E side. This site was levelled in 1966 during land reclamation. (Healy 1975, 1-19)

Distance This RMP site is located 1.6km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-039002-

Townland Ballybetagh

Site Type Hut site

Description A booley hut was levelled during land reclamation in 1966(Healy 1975). It was located on what is reclaimed pasture which falls SE to the Glencullen River Valley (Healy 1975, 1-19). There are no visible remains of this hut site.

Distance This RMP site is located 1.6km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-042002-

Townland Ballybetagh

Site Type Standing stone

Description A standing stone indicates the position of a chamber in a cairn.

Distance This RMP site is located 1.8km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-041----

Townland Ballybetagh

Site Type Enclosure

Description This enclosure is situated in pasture on a S facing slope above the Glencullen River. This site comprises a circular sloped area (int. diam. 18.5m) defined by a low, wide bank of earth and stone (Wth 3.2m; H 0.9-1.2m) revetted with larger boulders against its inner face. There are a number of irregular granite boulders in the interior. The enclosing bank is truncated in the E by a field boundary wall. There is a narrow opening in the W (Wth 1.6m). There is a passage tomb close-by to the N (DU026-042001)(Healy 1975, 1-19).

Distance This RMP site is located 1.9km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-038----

Townland Ballybetagh

Site Type Enclosure

Description The site is situated in reclaimed pasture on ground falling away gradually to the SE. It is marked as a circular enclosure on the 1843 OS 6-inch map (diam c. 30m). This may be one of the 'circles' at Ballybetagh identified in the OS Letters in 1837 (Herity 2001, 15). The enclosure is not visible at ground level.

Distance This RMP site is located 1.8km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-072----

Townland Ballybetagh

Site Type Enclosure

Description The enclosure site is situated on the W bank of a dried-up stream in upland pasture. It is shown on the 1836 OS 6-inch map as a series of irregular enclosures (Area dims.70m E-W; 55m N-S). This field has since been reclaimed leaving no visible remains.

Distance This RMP site is located 1.8km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-037----

Townland Ballybetagh

Site Type Enclosure

Description The site is situated in improved pasture in relatively level ground which falls away gradually to the SE. It is marked on the 1843 OS 6-inch map as a circular earthwork (diam c. 20m). The field has since been reclaimed leaving no visible trace of the monument at ground level.

Distance This RMP site is located 2km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-035----

Townland Ballybetagh

Site Type Enclosure

Description The site is situated in an area of improved pasture at the foot of Newtown mountain near Glencullen Village. This site is shown on the 1843 OS 6-inch map as a roughly circular enclosure (diam. c. 25m). It is probably one of the circles in Ballybetagh identified in the OS Letters in 1837 (Herity 2001, 15). The enclosure is not visible at ground level.

Distance This RMP site is located 1.5km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU025-047005-

Townland Newtown (Rathdown By.)

Site Type Field system

Description Recent aerial coverage of the area (OS 10:4735) shows a system of irregular fields extending into both the remaining unimproved pasture on the hill and the improved pasture N of the cashel.

Distance This RMP site is located 1.7km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU025-047006-

Townland Newtown (Rathdown By.)

Site Type Hut site

Description Situated on a S-facing, furze-covered slope above Glencullen village. A hut sites in the N half of a cashel (DU025-047004-) covered in furze (Herity 2001, 22-4).

Distance This RMP site is located 1.8km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU025-047004-

Townland Newtown (Rathdown By.)

Site Type Hut site

Description Situated on a S-facing, furze-covered slope above Glencullen village. A ringfort comprising of a circular sunken area (int. diam.23m) enclosed by a drystone wall (Wth 1.5m; H 0.6m) which rises to three courses and an external fosse (Wth 2m; D 0.5m). The interior is divided into two compartments by a curving wall. There are furze-covered hut sites in the N half. The entrance (Wth 5m) is in the SE. A series of curving field walls radiate from the W and SE of site (Herity 2001, 22-4). Recent aerial coverage of the area (OS 10:4735) shows a system of irregular fields extending into both the remaining unimproved pasture onthe hill and the improved pasture N of the cashel.

Distance This RMP site is located 1.8km southwest of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU025-047007-

Townland Newtown (Rathdown By.), Glencullen

Site Type Well

Description Situated on a S-facing, on a townland boundary above Glencullen village. The source of this record would appear to be the two named ‘Wells’ marked on the OS printed 1:5000 map (no. 3516, 09/03/1998) on either side of the townland boundary separating Glencullen from Newtown. The wells are not marked on the 1st edition OS 6-inch map but were indicated, unnamed, on the latest edition.

Distance This RMP site is located 1.7km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU025-047003-

Townland Newtown Little (Rathdown By., Glencullen ED)

Site Type Cairn – unclassified

Description The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded. To access available information for research purposes please make an appointment in advance with the Archive Unit (open

Fridays 10.00 am – 5.00 pm), Department of Culture, Heritage and the Gaeltacht, The Custom House, Dublin 1 D01W6XO or email nmarchive@chg.gov.ie.

Distance This RMP site is located 1.5km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU025-047002-

Townland Newtown (Rathdown By.)

Site Type Standing stone

Description Situated on the upper crest of a hill above the old chapel in Glencullen village. A standing stone comprising of a granite orthostat (H 1.75m) is square in plan (dims. 0.65m x 0.65m) and has a pointed top (Healy 1975, 1-19; Turner 1983, 14). Shown on the 1843 OS 6-inch map. Situated c. 6m NE of a barrow (DU025-047001-) on the upper crest of a hill.

Distance This RMP site is located 1.6km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU025-047001-

Townland Newtown (Rathdown By.)

Site Type Barrow – unclassified

Description Situated on the upper crest of a hill above the old chapel in Glencullen village. A barrow comprising of a circular round-topped mound (diam.25m; H 3.2m) defined by an inner fosse (Wth 5m; H 0.5m) and external bank (Wth 2.5m; H 0.5m). The site is damaged in the S where its bank has been truncated by a field boundary extending E-W. There is a single standing stone (DU025-047002-) to the NE of the bowl-barrow (Healy 1975, 1-19; Turner 1983, 14).

Distance This RMP site is located 1.6km west of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-122----

Townland Carrickmines Great

Site Type Linear earthwork

Description Goodbody (1993, 30) has identified a linear section of bank in a golf Course at Carrickmines, which he suggests, could be part of the Pale Ditch. This runs in a NNW-ESE direction on a plateau in a N facing mountain slope. It has extensive views of the Killiney coast in the E and Dublin Mountains in the S; views are restricted in the W and N. It comprises a flat-topped bank (L 106m, max. Wth 4m, H 0.70m). This is planted along its length with evergreen trees. There is a modern break in the S end of the earthwork. There is a ditch along the W side (Wth 3m, D 0.52m) and traces of a silted up ditch along the E side of the earthwork, near where it terminates in the S.

Distance This RMP site is located 1.5km east of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-018----

Townland Carrickmines Great

Site Type Cross

Description This granite boulder, containing a socket for a cross, is located in the front garden of a modern house, on the lands of Springfield Farm. It is level with the ground (boulder dims. L 0.76m, Wth 0.35m, D 0.23m). The socket is rectangular in plan (L 0.35m, Wth 0.20m, D 0.02m). According to the Schools Survey (1937) in the Irish Folklore Commission, there was a tradition that the cross was buried somewhere in the immediate vicinity (ÓhEalidhe 1959, 207).

Distance This RMP site is located 1.2km east of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-135----

Townland Fulacht fia

Site Type Carrickmines Great

Description The site was identified in 1998 during topsoil-stripping during the construction of a gas pipeline as a 7.5m (N-S) by 6m spread of burnt stone and charcoal in a loose, silty clay matrix. It had been truncated by a field drain running north-south through the middle of it. A pit was identified below the eastern portion of the site. It measured 0.95m (SE/NW) by 0.7m and was up to 0.42m deep. The pit was full of a deposit of burnt material that could not be distinguished from the burnt stone spread. A flake of struck flint was recovered (O Neill 2000, 37-9, O'Neill 1999).

Distance This RMP site is located 1.9km east of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU023-015006-

Townland Kill of the Grange

Site Type Graveslab

Description Situated on a low rise, in a green area, NE of Kill Abbey road. Crawford (1913) describes a triangular fragment of graveslab from the graveyard at Kill-of the Grange . This was incised with a Greek Cross which had splayed ends (L 0.13m). This was not located (Ó hÉalidhe 1959, 165; Healy 1975, 1-19).

The site is located within a complex which includes a pre-Norman church with a late medieval chancel (DU023-015001-), a graveyard (DU023-015002-), a holly well (DU023-015003-) a bullaun stone (DU023-015007-), a graveslab (DU023-015005-), a stone font (DU023-015009-), the base of a stone cross (DU023-015008-), an in situe cross (DU023-015012-) and two crosses (DU023-015004-) from the former laneway into the graveyard which are now in the care of the OPW in Trim, county Meath.

Distance This RMP site is located 1.8km east of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-150----

Townland Carrickmines Great

Site Type Fluacht fia

Description A burnt mound was identified during topsoil-stripping for the South-Eastern Motorway (M50). An area of decayed and burnt stone (L9m, Wth 20m) was revealed which covered two possible troughs . A sherd of Early Bronze Age pottery was found in the fill (O'Reilly 2004, 134).

Distance This RMP site is located 2km east of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-004003-

Townland Kilgobbin

Site Type Ritual site – holy well

Description This site is located in a flat area, which has been heavily landscape due to its location within Stepaside Golf Course. This is a natural spring well, dried up which marked by a setting and granite boulders. It lies in the middle of an old laneway defined on either side by a boundary ditch. The holy well had its pattern day on May 1st, the feast day of St. James (Goodbody 1993, 10). A cross stands beside the well (DU026-004004-).

Distance This RMP site is located 1.3km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-004004-

Townland Kilgobbin

Site Type Cross

Description This cross is located in a level area, which has been heavily landscape due to its location within Stepaside Golf Course. The cross stands in a disused laneway and marks the position of a holy well associated with St. James (DU026-004003-). This is a low stunted, granite cross with slightly projecting arms (dims. H 1.22m, Wth 0.61m). The SW face of the cross depicts a sheela-na-gig type figure, possibly seated with head sunk on it's shoulders (Guest 1936, 116, 123). This carving is listed by the National Museum of Ireland, as an exhibitionist figure that has been mistakenly identified as a sheela-na-gig (Cherry 1992, 10). The figure has been recorded by McMahon and Roberts as a sheela-na-gig (McMahon and Roberts 2001, 149). Described by Freitag as a ‘sheela carved in high relief on E face. Heavy round figure, with head set low between shoulders and slightly towards left; no ears; facial features and navel indicated. Arms in front of body; hands joined over pudenda represented, or covered by worn square object’ (Freitag 2004, 142). There is a circular moulding in high relief on the NE face.

Distance This RMP site is located 1.3km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-004002-

Townland Kilgobbin

Site Type Graveyard

Description This site is located in a flat area, which has been heavily landscape due to its location within Stepaside Golf Course. A levelled area identified as a burial ground SW of the cross at Jamestown (DU026-004004-; Turner 1983, 64; Goodbody 1993, 10).

Distance This RMP site is located 1.3km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-004001-

Townland Kilgobbin

Site Type Church

Description This site is located in a flat area, which has been heavily landscape due to its location within Stepaside Golf Course. There are no visible traces of the early church site associated with St. Caoin at Jamestown. It formerly lay close to a levelled area identified as a burial ground SW of the cross (DU026-004004-; Turner 1983, 64; Goodbody 1993, 10).

Distance This RMP site is located 1.3km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-156----

Townland Kilgobbin

Site Type Habitation site

Description Archaeological test excavations in 1998 revealed evidence for a settlement site in the form of post-holes and wall slots (Reid 2000, 66-67). Artefacts associated with the settlement included pottery and worked flints. A charcoal sample produced a date of 3670+-50 BP.

Distance This RMP site is located 1.8km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-128----

Townland Kilgobbin

Site Type Redundant record

Description The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded. To access available information for research purposes please make an appointment in advance with the Archive Unit (open Fridays 10.00 am – 5.00 pm), Department of Culture, Heritage and the Gaeltacht, The Custom House, Dublin 1 D01W6XO or email nmarchive@chg.gov.ie.

Distance This RMP site is located 1.6km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-003----

Townland Jamestown (Rathdwon By.)

Site Type Ritual site – holy well

Description The site is located on a gentle NE facing slope. This is a small spring well in a private garden. A statue of St. Patrick is in a niche over the well. Still venerated on St. Patrick's day (Ó Danachair 1958, 84).

Distance This RMP site is located 1.5km north of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

RMP No. DU026-136----

Townland Rathmichael

Site Type Fluacht fia

Description Monitoring of topsoil removal in 1998 uncovered a spread of burnt stone (mostly granite) and charcoal across an area measuring 4m x 3m. This was at most 0.25m deep except where it overlay a rectangular pit. The pit was just over 1.9m long, 0.8m wide and 0.6m deep. A number of stones had been set around the upper edge as a form of kerbing. This mostly survived on the eastern side (O Neill 2000, 37-9,).

Distance This RMP site is located 2km southeast of the Proposed Development site.

Impact This site will not be affected by the Proposed Development.

11.4.1 Topographical files, National Museum of Ireland (NMI)

The first edition of the six-inch Ordnance Survey map was carried out from 1837-1842. This map shows the Proposed Development site and surrounding areas as a series of agricultural land separated by field boundaries. There is a river located to the east of the Proposed Development and a road to the west and south of the Site. This similar layout is recorded in all mapping consulted.

11.4.2 Cartographic Analysis

11.4.2.1 Historic six-inch Ordinance Survey Map, 1837-1842

The first edition of the six-inch Ordnance Survey map was carried out from 1837-1842. This map shows the main Baily Court Hotel (formerly known as the Royal Hotel) in the lefthand corner of the Site with a small projection on the southern side, towards the rear of the building. Figure 11-2 shows the land to the north of the Site as open ground.

See Figure 11-2 OS mapping historic 6'' First Edition Colour (GEOHIVE).

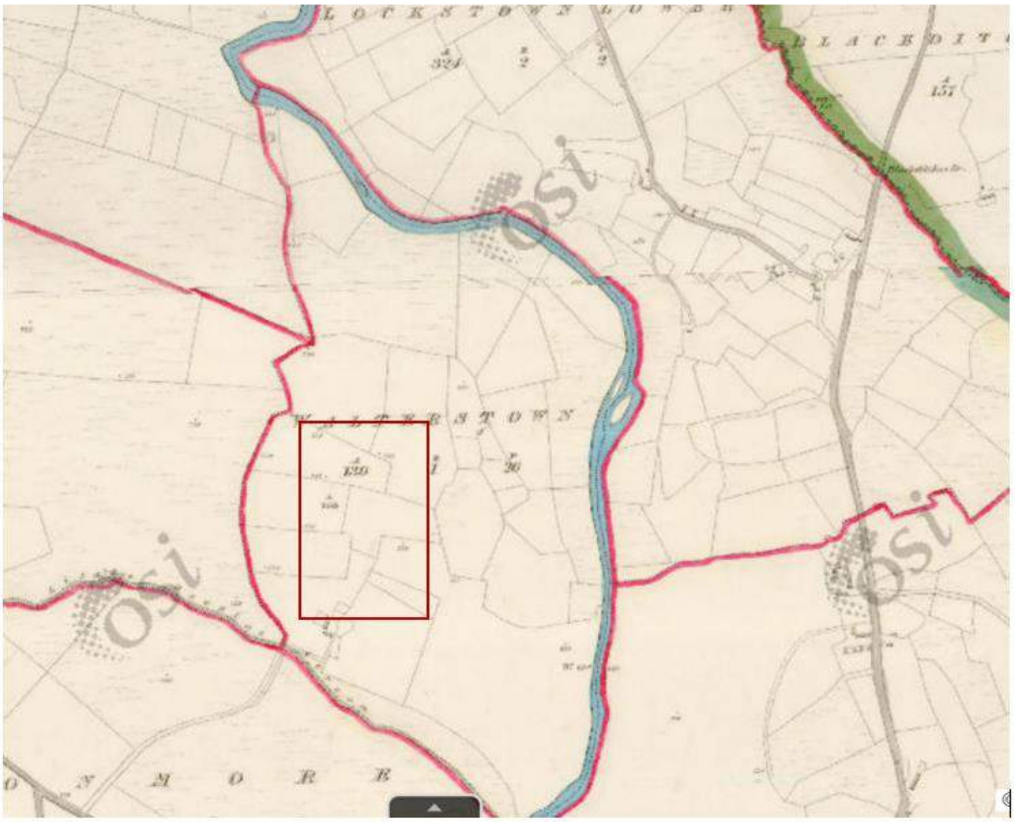

Figure 11-2: First Edition 6-inch Ordnance Survey Map, 1837-1842 with project site (Red outline)

11.4.3 Dun-Laoghaire Rathdown County Development Plan 2022 - 2028

The Dun-Laoghaire Rathdown County Council Development Plan addresses Architectural Conservation Areas, historic areas and Protected Structures, and recognises the statutory protection afforded to all Records of Monuments and Places (RMP) and all archaeological heritage sites under the National Monuments Legislation (1930-2004), and the development plan lists a number of aims and objectives in relation to archaeological and architectural heritage.

11.4.3.1 Architecture

Protection is also recognised to areas of cohesive architectural value and these areas can be classified as Architectural Conservation Areas (ACA), and any works that may have a material effect on the special character of an ACA needs planning permission. An area can be designated an ACA often because it contains a group of historic buildings or has a distinctive street size/plot size that contributes to the distinct character of a town or village. In the Dun Laoghaire Rathdown area, there are twenty-five Architectural Conservation Area Locations, as follows:

- Arkle Square
- Balally Terrace
- Campfield Terrace
- Castle Cottages
- Clarinda Park, Crosthwaite Park, Royal Terrace
- Dalkey
- Dundrum
- Foxrock
- Haigh Terrace to Park Road
- Killiney
- Marlborough Road
- Monkstown
- Montpelier Place
- Moss Cottages
- Newtown Villas
- Pembroke Cottages
- Sandycove Point
- Seafort Parade
- Silchester Road
- Sydenham Villas
- Sydenham Road
- Sydney Avenue
- Vesey Place, De Vesci Terrace and Willow Bank
- Vico Road
- Waltham Terrace

The Proposed Development does not lie within the vicinity of any of the above designated areas.

11.4.3.2 Protected Structures

A protected structure is a structure or part of a structure that a planning authority considers to be a special interest from an “architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest”.

In certain circumstances, some archaeological structures may also be considered as architectural heritage, meaning they may therefore appear on both the Record of Monuments and Places (RMP) and the Record of Protected Structures (RPS). These structures are

protected by both the National Monuments Acts and the Planning and Development Acts 2000 (as amended).

According to Appendix 4 of the Dun Laoghaire Rathdown County Development Plan 2022-2028, there are no records of Protected Structures within the Site of the Proposed Development, therefore none of the buildings due to be demolished are listed on the register of protected structures. The nearest protected structures in the vicinity of the Proposed Development site are Our Lady of the Wayside Church, RPS No. 1802 (known locally as the 'Blue Church') and Rockville House, RPS No. 1790. The Proposed Development will have no archaeological impact on Our Lady of the Wayside Church. In terms of visual impact, currently, the view from the Our Lady of the Wayside Church to East overlooks the R117, towards the Southwest of Proposed Development Site.

The view doesn't have much value because there is a spontaneous shrub-hedge that prevents much of the visibility to the east and ends up being marked by the presence of one dwelling (with a blind wall facing the road), a light post in the foreground and the light posts on the lawn that is used by Wayside Celtic FC, on the background. The Proposed Development ends up becoming the dominant element in this point of view. The visual impact is significant, especially from the garden in front of the church. However, the view is oriented towards the green amenity area further west of the Proposed Development, which facilitates better integration in visual terms with the surroundings. Special care must be given to the installation and maintenance of this open space, namely ensure the different strata of vegetation, so that the partial mitigation of this visual impact is ensured. The typology of the proposed buildings also ends up blending with the urban settlement in this area and the proposed stone wall on the west front helps to maintain the memory of the place in a way, since there was an existing stone wall, and to disguise the proposed buildings.

In the medium term, the view will be dominated by the proposed green structure, namely the trees, and by the stone wall in the foreground, next to the road. The minor visual impact of the proposed buildings will be almost completely mitigated.

The Proposed Development will have no archaeological impact on Rockville House. In terms of visual impact, the northeast part of the Proposed Development is partially visible behind Rockville House. This view is marked by the existence of a residential neighbourhood with a central garden, recently installed, and surrounded by the road that goes around the accesses to the dwellings. Rockville House occupies a central position in the view from this neighbourhood.The arboreal vegetation installed, in the foreground, still presents a very young size, allowing to see the background, marked by the Rockville House in the centre and the already adult-size trees.

The Proposed Development has a minor visual impact, as it is on a distant visual plan and is partially hidden by the large existing trees, most of them in Rockville House garden. However, it ends up breaking the framed view to the rustic house in the centre of the image.

Considering the proposed neutral colours and the fact that the buildings have heights similar to those of the existing buildings, it allows a better insertion in this context. The development of the proposed vegetation in the northeast periphery of the Proposed Development will be important for the mitigation of this visual impact, that will disappear in the medium-term.

11.4.3.3 Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) was reviewed in order to identify any buildings/features of architectural significance within 2km of the Proposed Development Site. The NIAH Registration Number refers to the registration number on the National Inventory of Architectural Heritage building survey of Wicklow. The NIAH is a section within the Department of the Arts Heritage and the Gaeltacht, and the work involves identifying and recording the architectural heritage of Ireland from 1700 to present day Ireland. It is important to note that there may be structures in the NIAH survey that are also included in the RPS, however not all of them are. There are 41 buildings of architectural significance located within 2km of the Proposed Development site.

Reg. No. 60260040

Townland: Glenamuck South

Date: 1700-1757

Original Use: Farm house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached five-bay two-storey double-pile over basement farmhouse with dormer attic, extant 1757, on a rectangular plan; three-bay two-storey rear (south) elevation. Occupied, 1911. Sold, 1965. Pitched double-pile (M-profile) slate roof centred on pitched (gabled) slate roof with terracotta ridge tiles, red brick Running bond chimney stacks having corbelled stepped capping supporting terracotta tapered pots, coping to gable, and replacement uPVC rainwater goods on rendered eaves retaining cast-iron conical hoppers and downpipes. Rendered, ruled and lined walls. Segmental-headed central door opening with cut-granite threshold between wrought iron railings, and cut-granite surround framing timber panelled door having fanlight. Square-headed window openings with cut-granite sills, and concealed dressings framing six-over-six timber sash windows without horns. Square-headed window openings to rear (south) elevation with cut-granite sills, and concealed dressings framing six-over-six timber sash windows without horns. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors; and carved timber surrounds to door openings to remainder framing timber panelled doors with timber panelled shutters to window openings. Set in landscaped grounds with rendered, ruled and lined piers to perimeter having cut-granite shallow pyramidal capping supporting wrought iron double gates.

Distance: This is located 0.03km eastof the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260041

Townland: Glenamuck South

Date: 1911-1937

Original Use: Gate lodge

Categories of Special Interest: Architectural

Description: Detached three-bay single-storey gate lodge, extant 1937, on a rectangular plan with three-bay single-storey rear (south) elevation. Now disused. Hipped slate roof with lichen-spotted terracotta ridge tiles, rendered chimney stacks having red brick corbelled stepped capping supporting terracotta or yellow terracotta octagonal pots, and replacement uPVC rainwater goods on timber eaves boards. Repointed coursed or snecked rock faced granite walls with tooled cut-granite flush quoins to corners. Square-headed central door opening approached by flight of five concrete steps with tooled cut-granite lintel framing glazed panelled door. Square-headed flanking window openings in bipartite arrangement with cut-granite sills, and tooled cut-granite block-and-start surrounds framing one-over-one timber sash windows. Square-headed window openings in bipartite arrangement to rear (south) elevation with cut-granite sills, and yellow brick block-and-start surrounds framing one-over-one timber sash windows. Set back from line of road at entrance to grounds of Rockville House.

Distance: This is located 0.05km east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260017

Townland: Glenamuck North

Date: 1852-1909

Original Use: Water pump

Categories of Special Interest: Artistic, Technical

Description: Freestanding cast-iron "lion mask" water hydrant, extant 1909. Road fronted on a corner site on concrete footpath.

Distance: This is located 0.1km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260018

Townland: Glenamuck South

Date: 1881-1909

Original Use: Post box

Categories of Special Interest: Artistic, Historical, Social

Description: Wall-mounted cast-iron "wall box" post box, extant 1909. Set in part creeper- or ivy-covered boundary wall.

Distance: This is located 0.1km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260021

Townland: Kilternan Domain

Date: 1925-1935

Original Use: Church/Chapel

Categories of Special Interest: Architectural, Artistic, Historical, Social, Technical

Description: Known locally as ‘Blue Church’. Detached six-bay double-height single-cell Catholic church, built 1929; dedicated 1929, on a rectangular plan with single-bay three-staged engaged tower to entrance (east) front on a square plan. Renovated with sanctuary reordered. Pitched profiled terracotta tile roof with lichen-covered terracotta ridge tiles terminating in Celtic Cross finial to apex (west), and cast-iron rainwater goods on timber boarded box eaves retaining cast-iron downpipes. Timber boarded walls on timber cushion course on rendered mass concrete plinth with timber band to eaves. Round-headed window openings between timber monolithic "pilasters" with Classical-style timber surrounds framing fixed-pane fittings having square glazing bars. Round-headed window opening to chancel (west) with timber surround framing fixed-pane fitting having leaded stained glass panel. Round-headed door opening to entrance (east) front with two concrete steps, and timber surround centred on keystone framing timber boarded double doors having fanlight. Roundel (second stage) with timber surround framing fixed-pane fitting having "spoke wheel" glazing bars. Grouped round-headed openings (bell stage) with timber surrounds centred on keystones framing louvered timber fittings. Interior including vestibule (east); square-headed door opening into nave with glazed timber double doors; full-height interior with carpeted central aisle between cruciform-detailed timber pews, timber panelled walls with paired timber stations between frosted glass windows, segmental barrel vaulted ceiling on thumbnail beaded-detailed cornice, and camber-headed chancel arch framing carpeted stepped dais to sanctuary (west) reordered with replacement timber altar table below stained glass "West Window". Set in landscaped grounds with rendered piers to perimeter having shallow pyramidal capping supporting wrought iron double gates.

Distance: This is located 0.1km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260036

Townland: Kilternan

Date: 1802-1810

Original Use: Miller's house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached seven-bay two-storey mill owner's house, extant 1810, on an L-shaped plan; single-bay (west) or three-bay (east) two-storey side elevations. Renovated to accommodate continued private residential use. Replacement pitched and hipped slate roof on an L-shaped plan with clay or terracotta ridge tiles, rendered chimney stacks having concrete capping supporting terracotta pots, and cast-iron rainwater goods on timber eaves boards retaining cast-iron downpipes. Creeper- or ivy-covered roughcast battered walls. Segmental-headed off-central door opening with concealed dressings framing replacement timber panelled door having fanlight. Square-headed window openings (ground floor) with cut-granite sills, and concealed dressings framing replacement timber casement windows having overlights replacing timber casement windows having overlights. Square-headed window openings (first floor) with cut-granite sills, and concealed dressings framing replacement timber casement windows replacing two-over-two timber sash windows. Set in landscaped grounds with cut-granite monolithic piers to perimeter having domed capping supporting "Lotus"-detailed cast-iron double gates.

Distance: This is located 0.2km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260025

Townland: Kilternan

Date: 1911-1937

Original Use: Gate lodge

Categories of Special Interest: Architectural

Description: Detached three-bay single-storey gate lodge, extant 1937, on a T-shaped plan centred on single-bay single-storey pedimented advanced porch; single-bay single-storey side elevations. Now disused. Hipped "fish scale" slate roof on a T-shaped plan centred on pitched (gabled) "fish scale" slate roof (porch), roll moulded clay ridge tiles centred on red brick Flemish bond chimney stack having chevron- or saw tooth-detailed stepped capping supporting terracotta or yellow terracotta tapered pots, lichen-covered cut-granite coping to gable forming open bed pediment with finial to apex, and no rainwater goods surviving on chevron- or saw tooth-detailed red brick header bond cornice. Part creeper- or ivy-covered

fine roughcast walls with rusticated cut-granite quoins to corners. Segmental-headed central door opening with overgrown threshold, and red brick block-and-start surround framing timber door having overlight. Camber-headed window openings with cut-granite sills, and red brick block-and-start surrounds framing two-over-two timber sash windows. Set back from line of road at entrance to grounds of Kilternan Lodge.

Distance: This is located 0.3km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260035

Townland: Kilternan

Date: 1850-1855

Original Use: Bridge

Categories of Special Interest: Architectural, Scientific, Technical

Description: Single-arch road bridge over river, built 1852; dated 1852. Part ivy-covered walls with cut-granite rounded coping to parapets centred on cut-granite date stone (west) or benchmark-inscribed cut-granite milestone (east). Single segmental arch with lichen-spotted granite ashlar voussoirs. Sited spanning Loughlinstown River with ivy-covered banks to river.

Distance: This is located 0.3km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260031

Townland: Kilternan

Date: 1844-1901

Original Use: House

Categories of Special Interest: Architectural, Artistic

Description: Detached four-bay two-storey house, extant 1901, on a T-shaped plan with shopfront to right ground floor; single-bay (single-bay deep) full-height central return (west). Closed, 1990. Renovated to accommodate alternative use. Pitched slate roof on a T-shaped plan centred on pitched slate roof (west) with clay ridge tiles, cut-granite coping to gables with tuck pointed granite ashlar chimney stacks to apexes having stringcourses below capping supporting terracotta or yellow terracotta tapered pots, and cast-iron rainwater goods on cut-granite beaded consoles retaining cast-iron octagonal or ogee hoppers and downpipes with cast-iron rainwater goods to rear (west) elevation on rendered cut-granite eaves retaining cast-iron octagonal or ogee hoppers and downpipes. Repointed coursed cut-granite wall to front

(east) elevation with cut-granite flush quoins to corners; rendered surface finish (remainder). Camber-headed off-central door opening with cut-granite step threshold, and rendered block-and-start surround having chamfered reveals framing timber panelled door having overlight. Timber shopfront to right ground floor on a symmetrical plan centred on timber panelled double doors having overlight. Square-headed window openings (first floor) with cut-granite sills, and rendered block-and-start surrounds framing two-over-two timber sash windows. Square-headed window openings (remainder) with cut-granite sills, and concealed dressings framing two-over-two timber sash windows. Interior including (first floor): carved timber surrounds to door openings framing timber panelled doors with carved timber surrounds to window openings framing timber panelled shutters. Road fronted with tarmacadam footpath to front having cut-granite kerbing.

Distance: This is located 0.4km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260030

Townland: Kilternan

Date: 1844-1909

Original Use: Water pump

Categories of Special Interest: Architectural, Artistic

Description: Freestanding timber "cow tail" waterpump, extant 1909. Now disused. Road fronted.

Distance: This is located 0.5km south of the Proposed Development site

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260029

Townland: Kilternan

Date: 1870-1875

Original Use: School

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached three-bay two-storey school, built 1873, on a cruciform plan centred on single-bay single-storey gabled projecting porch to ground floor; single-bay (single-bay deep) full-height central return (west). In use, 1949. For sale, 2012. Now disused. Pitched slate roof on a T-shaped plan centred on pitched slate roof (west); pitched (gabled) slate roof (porch), clay ridge tiles, lichen-covered rendered coping to gables with red brick Running bond

chimney stacks to apexes having stepped capping supporting yellow terracotta tapered pots, and replacement uPVC rainwater goods on cut-granite beaded consoles retaining cast-iron downpipes. Roughcast walls. Round-headed central window opening (porch) with concealed dressings framing fixed-pane fitting having margins. Square-headed opposing door openings ("cheeks") with concealed dressings framing timber boarded doors. Square-headed window openings with cut-granite sills, and concealed dressings framing two-over-two timber sash windows. Interior including (ground floor): vestibule; segmental-headed door opening into classroom with timber boarded double doors having overlight; classroom with carved timber surrounds to window openings framing timber panelled shutters; and (first floor): cast-iron Classical-style chimneypieces. Set back from road in landscaped grounds with roughcast piers to perimeter having rock faced cut-granite capping supporting iron double gates.

Distance: This is located 0.5km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260023

Townland: Kilternan

Date: 1720-1725

Original Use: Country house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached five-bay two-storey double-pile country house, built 1723; extant 1757, on a rectangular plan with single-bay (single-bay deep) full-height central return (west). Leased, 1911. Sold, 1975. Pitched slate roof on a T-shaped plan behind parapet with hipped slate roofs centred on pitched slate roof (west), clay ridge tiles, cut-granite coping to gables with rendered stepped chimney stacks to apexes having rendered capping supporting terracotta pots, and concealed rainwater goods retaining cast-iron octagonal or ogee hoppers and downpipes. Creeper- or ivy-covered roughcast wall to front (east) elevation with cut-granite coping to parapet; rendered surface finish (remainder). Square-headed central door opening with cut-granite step threshold, and cut-granite surround supporting "Cyma Recta"- or "Cyma Reversa"-detailed cornice on pulvinated frieze framing timber door. Square-headed window openings with cut-granite sills, and concealed dressings framing six-over-six timber sash windows without horns. Square-headed window openings to rear (west) elevation centred on round-headed window opening (half-landing) with cut-granite sills, and concealed dressings framing six-over-six timber sash windows centred on fixed-pane timber fitting having interlocking Y-tracery glazing bars. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors, and plasterwork cornice to ceiling; dining room (south) retaining carved timber surround to door opening framing timber panelled door with carved timber surrounds to window openings framing timber panelled shutters, and plasterwork cornice to ceiling; living room (north) retaining carved timber surround to door opening framing timber panelled door with carved timber surrounds to window openings framing timber panelled shutters, and plasterwork cornice to ceiling; bow-ended drawing room (west) retaining carved timber surround to door opening framing timber

panelled door with reclaimed carved timber surrounds to opposing window openings framing timber panelled shutters, cut-white marble Classical-style chimneypiece, and plasterwork cornice to ceiling; and carved timber surrounds to door openings to remainder framing timber panelled doors with carved timber surrounds to window openings framing timber panelled shutters. Set in landscaped grounds with tuck pointed granite ashlar piers to perimeter having stringcourses below shallow pyramidal capping supporting "Lotus"-detailed cast-iron double gates.

Distance: This is located 0.5km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260024

Townland: Kilternan

Date: 1700-1837

Original Use: Outbuilding

Categories of Special Interest: Architectural

Description: Detached nine-bay single-storey coach house-cum-stable outbuilding with half-attic, extant 1837, on a symmetrical plan. Pitched slate roof with clay ridge tiles, cut-granite coping to gables, and replacement uPVC rainwater goods on eaves boards on cut-granite eaves. Rendered battered walls; lime rendered or roughcast surface finish to rear (south) elevation with cast-iron "Pattress" tie plates. Segmental-headed central carriageway below "Lunette" blind opening with cut-granite block-and-start surround centred on keystone framing timber boarded double doors. Square-headed door openings below round-headed blind openings with cut-granite block-and-start surrounds centred on keystones framing timber boarded half-doors having louvered overpanels. Square-headed window openings with cut-granite sills, and concealed dressings framing timber casement windows having cast-iron lattice glazing bars. Set in landscaped grounds shared with Kilternan Lodge.

Distance: This is located 0.5km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260026

Townland: Kilternan

Date: 1860-1869

Original Use: Farm house

Categories of Special Interest: Architectural, Artistic

Description: Detached three-bay two-storey farmhouse, extant 1909, on a rectangular plan; three-bay two-storey rear (north) elevation. For sale, 2014. Pitched slate roof with clay ridge tiles, coping to gables with rendered chimney stacks to apexes having corbelled stepped capping supporting terracotta or yellow terracotta pots, and cast-iron rainwater goods on rendered eaves retaining cast-iron downpipes. Rendered walls bellcast over rendered plinth. Hipped segmental-headed central door opening in segmental-headed recess with chamfered timber mullions on step threshold supporting timber transom on "Acanthus"-detailed consoles, and concealed dressings framing timber panelled door having sidelights below fanlight. Square-headed window openings with cut-granite sills, and concealed dressings framing two-over-two timber sash windows. Square-headed central door opening to rear (north) elevation with concealed dressings framing timber panelled door. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors, staircase on a dog leg plan with turned timber balusters supporting carved timber banister terminating in finial-topped turned timber newels, and carved timber surrounds to door openings to landing framing timber panelled doors; dining room (west) retaining carved timber surround to door opening framing timber panelled door with carved timber surround to window opening framing timber panelled shutters on panelled risers, and moulded plasterwork cornice to ceiling; drawing room (east) retaining carved timber surround to door opening framing timber panelled door with carved timber surrounds to window openings framing timber panelled shutters on panelled risers, and picture railing below moulded plasterwork cornice to ceiling; and carved timber surrounds to door openings to remainder framing timber panelled doors with carved timber surrounds to window openings. Set in landscaped grounds on a corner site with repointed granite ashlar piers to perimeter having pyramidal capping supporting wrought iron double gates.

Distance: This is located 0.5km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260032

Townland: Kilternan

Date: 1830-1835

Original Use: House

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached three-bay two-storey double-pile house, begun 1832; completed 1834, on a rectangular plan with five-bay two-storey rear (south) elevation. Sold, 1989. Pitched double-pile (M-profile) slate roof behind parapet with clay ridge tiles, repointed granite ashlar chimney stacks having cut-granite stringcourses below capping supporting terracotta or yellow terracotta tapered pots, rooflights to rear (south) pitch, and concealed rainwater goods with cast-iron rainwater goods to rear (south) elevation on rendered cut-granite eaves retaining cast-iron downpipes. Part creeper- or ivy-covered rusticated "ashlar" wall to front (north) elevation on cut-granite plinth with rusticated cut-granite quoins to corners supporting parapet having ball finial-topped cut-granite coping; rendered surface finish to side elevations with

limewashed fine roughcast surface finish to rear (south) elevation on rendered plinth. Segmental-headed central door opening approached by two cut-granite steps with cut-granite step threshold, and cut-granite surround framing glazed timber panelled door having fanlight. Square-headed flanking window openings in tripartite arrangement with cut-granite sills, and moulded surrounds framing timber casement windows having sidelights below over lights. Square-headed window openings in tripartite arrangement (first floor) with cut-granite sills, and moulded surrounds framing six-over-six timber sash windows having two-over-two sidelights. Square-headed window openings to rear (south) elevation centred on square-headed window opening (half-landing) with cut-granite sills, and concealed dressings framing eight-over-eight (ground floor) or six-over-six (first floor) timber sash windows centred on eight-over-eight timber sash window. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors, staircase on a dog leg plan with turned timber balusters supporting carved timber banister terminating in volute, carved timber surround to window opening to half-landing framing timber panelled reveals or shutters, and carved timber surrounds to door openings to landing framing timber panelled doors; and carved timber surrounds to door openings to remainder framing timber panelled doors with carved timber surrounds to window openings framing timber panelled shutters. Set in landscaped grounds with rusticated piers to perimeter having lichen-covered gabled capping supporting wrought iron double gates.

Distance: This is located 0.6km south west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260033

Townland: Kilternan

Date: 1700-1837

Original Use: Farm house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached three-bay two-storey farmhouse, extant 1837, on a cruciform plan centred on single-bay single-storey projecting porch to ground floor on a half-octagonal plan; single-bay (single-bay deep) two-storey lean-to central return (east). For sale, 2011. Pitched slate roof on a T-shaped plan extending into lean-to slate roof (east); half-octagonal slate roof (porch), clay ridge tiles, coping to gables with roughcast chimney stacks to apexes having cut-granite capping supporting terracotta or yellow terracotta tapered pots, and cast-iron rainwater goods on rendered cut-granite eaves retaining cast-iron downpipes. Roughcast walls. Square-headed central door opening into farmhouse with moulded surround framing timber panelled double doors. Square-headed flanking window opening (north) with cut-granite sill, and concealed dressings framing one-over-one timber sash window. Square-headed flanking window opening in tripartite arrangement (south) with cut-granite sill, timber mullions, and concealed dressings framing eight-over-eight timber sash window having two-over-two sidelights. Square-headed window openings (first floor) with cut-granite sills, and concealed dressings framing six-over-six timber sash windows. Interior including (ground floor): central

hall retaining carved timber surrounds to door openings framing timber panelled doors; and carved timber surrounds to door openings to remainder framing timber panelled doors with timber panelled shutters to window openings. Set in own grounds.

Distance: This is located 0.7km south west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260044

Townland: Glenamuck South

Date: 1700-1837

Original Use: House

Categories of Special Interest: Architectural, Artistic

Description: Detached four-bay two-storey house, extant 1837, on a rectangular plan. For sale, 2010. Pitched slate roof with clay ridge tiles, cut-granite coping to gables with rendered chimney stacks to apexes having "Cavetto"-detailed stepped capping supporting terracotta or yellow terracotta octagonal pots, and cast-iron rainwater goods on roughcast cut-granite eaves retaining cast-iron downpipes. Roughcast walls bellcast over rendered plinth. Segmental-headed off-central door opening with cut-granite step threshold, and moulded rendered surround framing timber panelled door having fanlight. Square-headed window openings with cut-granite sills, and bull nose-detailed rendered surrounds framing six-over-six (ground floor) or six-over-three (first floor) timber sash windows. Set back from line of road in landscaped grounds.

Distance: This is located 0.7km south east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260043

Townland: Glenamuck South

Date: 1844-1909

Original Use: House

Categories of Special Interest: Architectural, Artistic

Description: Detached three-bay two-storey house, extant 1909, on a rectangular plan. Renovated and extended, 2003. Pitched slate roof with clay ridge tiles, cut-granite coping to gables with rendered chimney stacks to apexes having stringcourses below stepped capping supporting terracotta or yellow terracotta octagonal pots, and replacement uPVC rainwater goods on rendered eaves retaining cast-iron octagonal or ogee hoppers and downpipes.

Replacement rendered walls. Segmental-headed central door opening with cut-granite step threshold, timber doorcase with panelled pilasters supporting lead-covered cornice on "Acanthus"-detailed fluted consoles, and concealed dressings framing timber panelled door having overlight. Square-headed window openings with cut-granite sills, and concealed dressings framing two-over-two timber sash windows. Set back from line of road in landscaped grounds.

Distance: This is located 0.7km south east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260042

Townland: Tiknick

Date: 1844-1899

Original Use: Farm house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached three-bay two-storey farmhouse, extant 1899, on a rectangular plan centred on single-bay single-storey gabled projecting glazed porch to ground floor. Pitched slate roof with clay ridge tiles, coping to gables with rendered chimney stacks to apexes having capping supporting terracotta or yellow terracotta pots, and cast-iron rainwater goods on rendered eaves retaining cast-iron downpipes. Rendered walls. Segmental-headed central door opening into farmhouse. Square-headed window openings with cut-granite sills, and concealed dressings framing six-over-six timber sash windows. Set in landscaped grounds with piers to perimeter having ivy-covered shallow pyramidal capping.

Distance: This is located 0.9km east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260046

Townland: Ballycorus

Date: 1860-1865

Original Use: Worker’s house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached three-bay two-storey over part raised basement lead works manager's house, designed 1862; built 1862-4, on an F-shaped plan centred on single-bay full-height breakfront abutting single-bay full-height gabled projecting end bay; two-bay (south) or single-bay (north) full-height side elevations with three-bay full-height rear (west) elevation.

Occupied, 1911. Now in private residential use. Pitched and hipped slate roof on an F-shaped plan centred on hipped slate roof (breakfront), clay ridge tiles, rendered chimney stacks having rendered capping supporting terracotta tapered pots, and replacement uPVC rainwater goods on timber eaves boards. Part creeper- or ivy-covered tuck pointed snecked granite walls on battered base with cut-granite flush quoins to corners. Pointed segmental-headed central door opening approached by flight of seven cut-granite steps between cast-iron railings with cut-granite block-and-start surround having chamfered reveals framing timber panelled door having overlight. Square-headed window openings with cut-granite block-and-start surrounds (ground floor) or cut-granite surrounds (first floor) having chamfered reveals framing two-over-two timber sash windows. Pointed segmental-headed central door opening to rear (west) elevation with cut-granite block-and-start surround having chamfered reveals framing timber panelled door having overlight. Square-headed flanking window openings in tripartite arrangement with cut-granite block-and-start surrounds having chamfered reveals framing two-over-two timber sash windows having one-over-one sidelights. Square-headed window openings (first floor) with cut-granite surrounds having chamfered reveals framing two-over-two timber sash windows behind wrought iron bars. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors; and carved timber surrounds to door openings to remainder framing timber panelled doors with timber panelled shutters to window openings. Set in landscaped grounds shared with Ballycorus Lead Works.

Distance: This is located 1.4km south east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260047

Townland: Ballycorus

Date: 1860-1865

Original Use: Gates/railings/walls

Categories of Special Interest: Architectural

Description: Gateway, extant 1909, on a symmetrical plan comprising pair of tuck pointed granite ashlar piers on battered bases having cut-granite chamfered capping with "arrow loop"-detailed tuck pointed snecked granite outer piers on battered bases having cut-granite chamfered capping. Lane fronted at entrance to grounds of Ballycorus Lead Works.

Distance: This is located 1.4km south east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260053

Townland: Ballycorus

Date: 1844-1901

Original Use: House

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached three-bay two-storey house, occupied 1901, on a square plan centred on single-bay single-storey gabled advanced porch to ground floor; two-bay two-storey side elevations with three-bay two-storey rear (east) elevation. For sale, 2008. Hipped slate roof on an E-shaped plan; pitched (gabled) slate roof (porch), clay ridge tiles with crested terracotta ridge tiles (porch), paired rendered central chimney stacks on rendered bases having red brick header bond beaded stringcourses below stepped capping supporting terracotta or yellow terracotta tapered pots, lead-covered timber bargeboards to gable on "Cyma Recta"- or "Cyma Reversa"-detailed timber purlins, and replacement uPVC rainwater goods on "Cavetto"-detailed exposed timber rafters retaining some cast-iron downpipes. Roughcast walls on cut-granite chamfered plinth with red brick quoins to corners. Segmental-headed central door opening (porch) with cut-granite step threshold, and concealed dressings having bull nose-detailed reveals framing glazed timber panelled door having overlight. Round-headed window openings ("cheeks") with cut-granite sills, and concealed dressings framing one-over-one timber sash windows behind wrought iron bars. Paired round-headed window openings (first floor) with cut-granite sills, and concealed dressings framing one-over-one timber sash windows. Square-headed window openings with cut-granite sills, and concealed dressings framing two-over-two timber sash windows. Interior including (ground floor): vestibule; door opening into hall with glazed timber panelled double doors having sidelights on panelled risers below overlight; hall retaining carved timber surrounds to door openings framing timber panelled doors; and carved timber surrounds to door openings to remainder framing timber panelled doors with timber panelled shutters to window openings. Set in landscaped grounds with cut-granite piers to perimeter having shallow pyramidal capping supporting "Fleur-de-Lys"-detailed wrought iron double gates.

Distance: This is located 1.4km south east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260045

Townland: Ballycorus

Date: 1855-1865

Original Use: Building misc

Categories of Special Interest: Architectural

Description: Lead works complex, established 1826, including: Façade of detached five-bay single-storey building with half-attic, built 1860, on a rectangular plan. Closed, 1913. Disused, 1937. Modified to accommodate alternative use. Pitched slate roof with roll moulded clay or terracotta ridge tiles, cut-granite coping to gables with red brick Running bond chimney stacks to apexes on rendered chamfered cushion courses on red brick Running bond bases having

red brick capping, and replacement uPVC rainwater goods on chevron- or saw tooth-detailed red brick header bond cornice. Part creeper- or ivy-covered repointed tuck pointed coursed or snecked granite walls with red brick flush quoins to corners centred on cast-iron "Pattress" tie plates. Series of three Tudor-headed carriageways with red brick block-and-start surrounds framing replacement fittings. Tudor-headed window openings in bipartite arrangement with lichen-spotted cut-granite sills, timber Y-mullions, and red brick block-and-start surrounds framing two-over-two timber sash windows. Oculus window openings (half-attic) with red brick voussoir surrounds framing replacement fixed-pane fittings. Set in shared grounds.

Distance: This is located 1.4km south east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260048

Townland: Ballycorus

Date: 1835-1840

Original Use: Building misc

Categories of Special Interest: Architectural, Technical

Description: Flue, built 1836, on a curvilinear L-shaped plan. Decommissioned, 1863. Now disused. Creeper- or ivy-covered coursed rubble granite battered walls. Series of square-headed "inspection hatch" openings with cut-granite lintels. Barrel-vaulted interior with yellow brick Running bond lining. Lane fronted with tarmacadam footpath having cut-granite coping.

Distance: This is located 1.5km south east of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260050

Townland: Ballycorus

Date: 1855-1860

Original Use: Chimney

Categories of Special Interest: Architectural, Technical

Description: Freestanding chimney, built 1857-8, on a circular plan. Disused, 1909. Part repointed coursed rubble stone walls retaining sections of roughcast surface finish; yellow brick English bond surface finish (top stage) with yellow brick header bond corbelled stepped stringcourse below capping. Set in relandscaped grounds.

Distance: This is located 1.8km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260037

Townland: Kiltiernan

Date: 1844-1901

Original Use: Country house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached three-bay single-storey over basement country house with half-dormer attic, occupied 1901, on an L-shaped plan with single-bay single-storey gabled projecting porch (north) or single-bay single-storey gabled projecting end bay (south); single-bay (single-bay deep) full-height central return (east) abutting five-bay (three-bay deep) two-storey farmhouse on a rectangular plan. In occasional use, 1911. Part refenestrated. WEST: Pitched slate roof on an L-shaped plan centred on paired gablets to window openings to half-dormer attic; pitched (gabled) slate roof (porch), clay ridge tiles, tuck pointed granite ashlar chimney stacks having cut-granite "Cavetto" stringcourses below chamfered capping supporting ribbed terracotta or yellow terracotta tapered pots, roll-topped cut-granite "Cavetto" coping to gables on cut-granite "Cavetto" kneelers, and cast-iron rainwater goods on cut-granite cornice retaining cast-iron square profile downpipes. Tuck pointed snecked granite walls on lichen-spotted cut-granite chamfered cushion course on margined rock faced granite ashlar plinth with cut-granite flush quoins to corners. Square-headed window openings with cut-granite cruciform mullions (ground floor) or cut-granite mullions (half-dormer attic), and cut-granite block-and-start surrounds having chamfered reveals framing timber casement windows (ground floor) or replacement uPVC casement windows (half-dormer attic); EAST: Hipped slate roof on a U-shaped plan with pressed or rolled lead ridges, rendered chimney stacks having cut-granite "Cavetto" stringcourses below chamfered capping supporting terracotta or yellow terracotta pots, and cast-iron rainwater goods on slightly overhanging eaves retaining cast-iron downpipes. Rendered, ruled and lined walls. Square-headed window openings with cut-granite sills, and concealed dressings framing six-over-six timber sash windows including some six-over-six timber sash windows without horns. Set in landscaped grounds with fluted cast-iron octagonal piers to perimeter having "Cavetto"-detailed pyramidal capping supporting wrought iron double gates.

Distance: This is located 1km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260028

Townland: Ballybetagh

Date: 1844-1909

Original Use: Gates/railings/walls

Categories of Special Interest: Architectural, Artistic

Description: Gateway, extant 1909, on a symmetrical plan comprising pair of vermiculated-banded granite ashlar piers supporting replacement steel double gates with vermiculated-banded granite ashlar outer piers supporting spear head-detailed cast-iron railings. Now disused. Road fronted at entrance to grounds of Springfield.

Distance: This is located 1.4km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260027

Townland: Ballybetagh

Date: 1816-1837

Original Use: County house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached five-bay two-storey over basement country house, extant 1837, on a T-shaped plan centred on (single-storey) prostyle distyle in antis portico to ground floor; five-bay full-height rear (west) elevation. Occupied, 1911. Adapted to alternative use, 1927. Sold, 1970, to accommodate alternative use. Resold, 2001. "Restored", 2006, to accommodate proposed alternative use. Abandoned, 2009. For Sale, 2014. Now disused. Replacement hipped slate roof on a quadrangular plan with terracotta ridge tiles, paired repointed granite ashlar central chimney stacks on axis with ridge having stringcourses below capping supporting terracotta or yellow terracotta octagonal or tapered pots, and cast-iron rainwater goods on cut-granite modillioned cornice retaining cast-iron downpipes. Replacement rendered walls; rendered, ruled and lined surface finish to rear (west) elevation on cut-granite cushion course on rendered, ruled and lined base. Square-headed central door opening behind (single-storey) prostyle distyle in antis portico with cut-granite fluted columns between cut-granite monolithic pilasters supporting "Cyma Recta"- or "Cyma Reversa"-detailed cornice on triglyph frieze on entablature, and cut-granite surround framing timber panelled door. Square-headed window opening in tripartite arrangement (first floor), cut-granite sill, timber panelled pilaster mullions, and concealed dressings with "Cyma Recta"- or "Cyma Reversa"-detailed hood moulding on consoles framing four-over-four timber sash windows without horns. Square-headed window openings with cut-granite sills, and concealed dressings framing six-over-six timber sash windows without horns. Square-headed window openings to rear (west) elevation with cut-granite sills, and concealed dressings framing six-over-six timber sash windows without horns. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors; reception room (south-east) retaining carved timber surround to door opening framing timber panelled door with carved timber surrounds to window openings framing timber panelled shutters on panelled risers, chimneypiece, and plasterwork cornice to ceiling; reception room (north-east) retaining carved timber surround to door opening framing timber panelled door with carved timber surrounds

to window openings framing timber panelled shutters on panelled risers, chimneypiece, and plasterwork cornice to ceiling; and carved timber surrounds to door openings to remainder framing timber panelled doors with carved timber surrounds to window openings framing timber panelled shutters on panelled risers. Set in relandscaped grounds on an elevated site.

Distance: This is located 1.7km south of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260039

Townland: Ballybetagh

Date: 1700-1837

Original Use: Farm house

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached five-bay two-storey farmhouse, extant 1837, on an L-shaped plan with single-bay (single-bay deep) single-storey double-pile return with half-dormer attic (west). Occupied, 1911. Sold, 2000. Restored, 2002-3. Pitched slate roof on an L-shaped plan behind parapet with pitched double-pile (M-profile) slate roof (west), clay ridge tiles, cut-granite coping to gables with rendered chimney stacks to apexes having stepped capping supporting terracotta tapered pots, and concealed rainwater goods retaining cast-iron ogee hoppers and downpipes. Roughcast walls on rendered chamfered plinth with cut-granite coping to parapet. Segmental-headed central door opening with cut-granite step threshold, and cut-granite block-and-start surround centred on keystone framing timber panelled door having fanlight. Square-headed window openings with cut-granite sills, and concealed dressings framing replacement two-over-two timber sash windows without horns. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors; and carved timber surrounds to door openings to remainder framing timber panelled doors with timber panelled shutters to window openings. Set in landscaped grounds with roughcast piers to perimeter having shallow pyramidal capping supporting wrought iron double gates.

Distance: This is located 1.3km south west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60250026

Townland: Glencullen

Date: 1911-1937

Original Use: Water pump

Categories of Special Interest: Artistic, Technical

Description: Freestanding cast-iron "cow tail" waterpump, extant 1937. Set back from line of road on concrete base with mass concrete boundary wall to perimeter having lichen-spotted coping.

Distance: This is located 1.9km south west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60250018

Townland: Glencullen ed

Date: 1800-1837

Original Use: Kiln

Categories of Special Interest: Architecture, Technical

Description: Freestanding single-oven single-stage lime kiln, extant 1837, on a square plan. Disused, 1909. Part creeper- or ivy-covered coursed rubble stone walls with lichen-spotted roughhewn rubble stone flush quoins to corners. Single square-headed oven with roughhewn granite lintel. Set in hillside in field.

Distance: This is located 1.8km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60250017

Townland: Glencullen ed

Date: 1844-1909

Original Use: Farm house

Categories of Special Interest: Architecture, Artistic

Description: Detached three-bay two-storey farmhouse, extant 1909, on a T-shaped plan with single-bay (single-bay deep) two-storey lower central return (south). Renovated, 2010. Hipped slate roof centred on pitched slate roof (south) with clay or terracotta ridge tiles, rendered chimney stacks having moss-covered stepped capping supporting yellow terracotta tapered pots, and replacement uPVC rainwater goods on timber eaves boards on box eaves retaining cast-iron octagonal hoppers and downpipes. Rendered, ruled and lined walls. Round-headed central door opening approached by flight of six cut-granite steps with concealed dressings framing replacement glazed panelled door having sidelights below overlight. Square-headed window openings with cut-granite sills, and concealed dressings framing replacement two-over-two sash windows. Set in landscaped grounds with rendered piers to perimeter having "mushroom" capping supporting tubular steel "farm gate".

Distance: This is located 1.5km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60250025

Townland: Glencullen

Date: 1820-1825

Original Use: Church/Chapel

Categories of Special Interest: Architecture, Artistic, Historical, Social

Description: Detached five-bay double-height Catholic chapel, dated 1824, on a rectangular plan comprising four-bay double-height nave opening into single-bay double-height chancel (south). Closed, 1909. Now in ruins. Roof now missing, lichen-covered cut-granite coping to gables including lichen-covered cut-granite coping to gable to chancel (south) with cut-granite Cross finial to apex, and no rainwater goods surviving on lichen-covered cut-granite eaves retaining cast-iron "Tulip" hoppers and downpipes. Part ivy-covered fine roughcast coursed rubble stone walls with concealed cut-granite flush quoins to corners; rendered, ruled and lined surface finish (south) with cut-limestone date stone ("1824") in cut-granite surround. Lancet window openings with cut-granite sills, and cut-granite surrounds framing fixed-pane fittings having cast-iron lattice glazing bars. Tudor-headed window opening to chancel (south) with cut-granite sill, and cut-granite block-and-start surround with no fittings surviving. Square-headed opposing door openings (north) with overgrown thresholds, and cut-granite surrounds with paired engaged colonettes on plinths supporting "Cyma Recta"- or "Cyma Reversa"-detailed cornices. Interior in ruins. Set in own grounds on a slightly elevated site with cut-granite piers to perimeter having lichen-covered cut-granite capping supporting cast-iron double gates.

Distance: This is located 2km south west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60250015

Townland: Ballyedmonduff

Date: 1911-1937

Original Use: Water pump

Categories of Special Interest: Artistic, Technical

Description: A water hydrant supplied by Glenfield and Kennedy (established 1852) of Kilmarnock representing an interesting example of mass-produced cast-iron work making a pleasing, if largely inconspicuous visual statement in a rural street scene.

Distance: This is located 1.8km west of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260011

Townland: Glencullen ed

Date: 1820-1830

Original Use: Church/Chapel

Categories of Special Interest: Architectural, Artistic, Historical, Scientific, Social, Technical

Description: A water hydrant supplied by Glenfield and Kennedy (established 1852) of Kilmarnock representing an interesting example of mass-produced cast-iron work making a pleasing, if largely inconspicuous visual statement in a rural street scene.

Distance: This is located 0.5km north of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260013

Townland: Glencullen ed

Date: 1844-1901

Original Use: Sexton’s house

Categories of Special Interest: Architectural, Artistic

Description: Detached four-bay single-storey groundskeeper's house, occupied 1901, on a T-shaped plan off-centred on single-bay single-storey gabled projecting lower porch. "Refurbished", 2002. Pitched slate roof on a T-shaped plan extending into hipped slate roof abutting pitched (gabled) slate roof (porch), clay ridge tiles, rendered chimney stacks having concrete capping supporting terracotta pots, timber bargeboards to gables on timber spandrels, and cast-iron rainwater goods on timber eaves boards on exposed timber rafters retaining cast-iron octagonal or ogee hoppers and downpipes. Roughcast walls on rendered plinth with "timber frame" surface finish to gables. Square-headed off-central door opening with step threshold, and timber surround having bull nose-detailed reveals framing glazed timber panelled double doors. Square-headed flanking window openings with cut-granite sills, and concealed dressings framing timber casement windows. Set in landscaped grounds shared with Saint Tiernan's Church (Kiltiernan).

Distance: This is located 0.5km north of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260012

Townland: Glencullen ed

Date: 1835-1840

Original Use: School

Categories of Special Interest: Architectural, Historical, Social

Description: Detached four-bay single-storey groundskeeper's house, occupied 1901, on a T-shaped plan off-centred on single-bay single-storey gabled projecting lower porch. "Refurbished", 2002. Pitched slate roof on a T-shaped plan extending into hipped slate roof abutting pitched (gabled) slate roof (porch), clay ridge tiles, rendered chimney stacks having concrete capping supporting terracotta pots, timber bargeboards to gables on timber spandrels, and cast-iron rainwater goods on timber eaves boards on exposed timber rafters retaining cast-iron octagonal or ogee hoppers and downpipes. Roughcast walls on rendered plinth with "timber frame" surface finish to gables. Square-headed off-central door opening with step threshold, and timber surround having bull nose-detailed reveals framing glazed timber panelled double doors. Square-headed flanking window openings with cut-granite sills, and concealed dressings framing timber casement windows. Set in landscaped grounds shared with Saint Tiernan's Church (Kiltiernan).

Distance: This is located 0.5km north of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260014

Townland: Jamestown

Date: 1700-1837

Original Use: House

Categories of Special Interest: Architectural, Artistic, Historical, Social

Description: Detached three-bay two-storey house, extant 1837, on a cruciform plan centred on single-bay single-storey flat-roofed projecting porch to ground floor; single-bay (single-bay deep) two-storey central return (west). "Improved", pre-1909, producing present composition. Occupied, 1911. For sale, 1973. Hipped slate roof abutting hipped slate roof (west) with clay ridge tiles, rendered central chimney stacks having concrete capping supporting terracotta tapered pots, and cast-iron rainwater goods on rendered eaves retaining cast-iron octagonal or ogee hoppers and downpipes. Rendered, ruled and lined walls to front (east) elevation; slate hung surface finish to side (south) elevation with roughcast surface finish to side (north) elevation. Square-headed central door opening approached by two cut-granite steps with concealed dressings framing glazed timber panelled double doors. Square-headed door

opening into house with concealed dressings framing glazed timber panelled double doors. Square-headed window openings (ground floor) with cut-granite sills, and concealed dressings framing two-over-two timber sash windows having two-over-two sidelights. Square-headed window openings (first floor) with cut-granite sills, and concealed dressings framing four-over-eight timber sash windows. Square-headed window openings (west) with cut-granite sills, and concealed dressings framing six-over-six timber sash windows. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors; and carved timber surrounds to door openings to remainder framing timber panelled doors with timber panelled shutters to window openings. Set in landscaped grounds.

Distance: This is located 0.5km north of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60260015

Townland: Jamestown

Date: 1905-1910

Original Use: Farmhouse

Categories of Special Interest: Architectural, Artistic

Description: Detached three-bay two-storey farmhouse, built 1907; extant 1909, on a T-shaped plan originally three-bay two-storey on a rectangular plan with single-bay (single-bay deep) full-height central return (west). Renovated, 1990. Reroofed, 2012. Replacement pitched slate roof on a T-shaped plan centred on pitched slate roof (west) with clay ridge tiles, coping to gables with cement rendered chimney stacks to apexes having rendered capping supporting yellow terracotta tapered pots, and cast-iron rainwater goods on rendered eaves retaining cast-iron downpipes. Creeper- or ivy-covered rendered, ruled and lined walls. Round-headed central door opening with cut-granite step threshold, and concealed dressings framing timber panelled double doors having overlight. Square-headed window openings with cut-granite sills, and concealed dressings framing two-over-two timber sash windows. Interior including (ground floor): central hall retaining carved timber surrounds to door openings framing timber panelled doors, staircase on a dog leg plan with turned timber balusters supporting carved timber banister terminating in ball finial-topped turned timber newel, and carved timber surrounds to door openings to landings framing timber panelled doors; dining room (south) retaining carved timber surround to door opening framing timber panelled door with carved timber surrounds to window openings framing timber panelled shutters; drawing room (north) retaining carved timber surround to door opening framing timber panelled door with carved timber surrounds to window openings framing timber panelled shutters; and carved timber surrounds to door openings to remainder framing timber panelled doors with carved timber surrounds to window openings framing timber panelled shutters. Set back from road in landscaped grounds with cut-granite tapered piers to perimeter having pyramidal capping supporting looped wrought iron double gates.

Distance: This is located 0.9km north of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60250015

Townland: Stepaside

Date: 1700-1837

Original Use: Building misc

Categories of Special Interest: Architectural

Description: Pound, extant 1837, on a rectangular plan. Now disused. Part repointed walls with concrete or rendered coping. Square-headed central opening with roughhewn granite lintel framing ivy-entangled flat iron gate. Street fronted with tarmacadam footpath to front.

Distance: This is located 1.9km north of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

Reg. No. 60250013

Townland: Stepaside

Date: 1939-1984

Original Use: Post box

Categories of Special Interest: Artistic, historical, social

Description: Freestanding cast-iron "pillar box" post box, between 1939-84, with "P&T [Posts and Telegraphs]" monogram. Street fronted on concrete brick cobbled footpath.

Distance: This is located 1.9km north of the Proposed Development site.

Impact: This site will not be affected by the Proposed Development.

11.5 Potential Impact of the Proposed Development

11.5.1 Construction Phase

This section assesses the impact of the Proposed Development on the Archaeology and Cultural Heritage of the area during the Construction Phase.

The greatest impact to buried archaeological deposits occurs during large-scale removal of topsoil during the initial construction phase groundworks. However, as the closest recorded RMP site is located 0.03km from the Site, it is predicted that the Construction Phase of the

development will not cause any significant impact on the Archaeology and Cultural Heritage of the area as a result of construction and excavation works.

11.5.2 Operational Phase

The Operational Phase of the Proposed Development will not result in any impact on the Archaeology and Cultural Heritage of the area.

11.5.3 Potential Cumulative Impacts

In the context of archaeology and cultural heritage impact, no cumulative effects are anticipated from the Proposed Development.

11.5.4 "Do Nothing" Impact

A do-nothing scenario would result in the Site remaining as former playing fields and agricultural lands (grazing of cattle) over an area of 10.9Ha, including approximately 0.35Ha of derelict farmyard area. Archaeological or cultural remains will not be impacted upon, the same as the scenario for the Proposed Operational Phase of the Development.

11.6 Avoidance, Remedial & Mitigation Measures

11.6.1 Construction Phase

It is possible that excavation works associated with the Proposed Development may have an adverse impact on small or isolated previously unrecorded archaeological features or deposits that have the potential to survive beneath the current ground level. If any archaeological remains are discovered during this project, all works will cease and an expert archaeologist will be brought to Site and all future works will be carried out under the supervision of the archaeologist.

11.6.2 Operational Phase

Since no known archaeological, architectural or cultural heritage remains were found during the desk top survey, it is likely that there are no further mitigation measures required for this development.

11.6.3 "Worst Case" Scenario

In the worst-case scenario where mitigation measures fail for the Proposed Development, it is considered that there is potential that a monument of cultural heritage or importance could be damaged. This is considered highly unlikely and indeterminable.

11.7 Residual Impacts

Residual Impacts are defined *as 'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

No negative residual impacts in the context of archaeology and cultural heritage are anticipated regarding this Proposed Development.

11.8 Monitoring

No specific monitoring measures are required in relation to archaeology and cultural heritage given the fact that it is not predicted that the Proposed Development will have any adverse impacts on any archaeological features or deposits.

11.9 Interactions

Interactions between Archaeology and Cultural Heritage and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

11.9.1 Landscape and Visual

It is not predicted that any changes in landscape or visual amenities will affect in any way the archaeology and cultural heritage of the area.

11.10 Difficulties Encountered When Compiling

There were no difficulties in compiling the specified information with regard to archaeological, architectural and cultural heritage.

11.11 References

Archaeological Survey Database, available at: http://webgis.archaeology.ie/historicenvironment/

Department of Arts, Heritage, Gaeltacht and the Islands (1999b). Policy and Guidelines on Archaeological Excavation. Dublin. Government Publications Office.

National Monuments of Ireland database available at: http://webgis.archaeology.ie/historicenvironment/

National Inventory of Archaeological Heritage, available at: http://www.buildingsofireland.ie/Surveys/Buildings/

OSI mapping (www.osi.ie)

https://heritagemaps.ie/WebApps/HeritageMaps/index.html

www.excavations.ie

Dún Laoghaire - Rathdown County Council Development Plan (2022-2028) https://www.dlrcoco.ie/en/county-development-plan/county-development-plan-2022-2028

12 MATERIAL ASSETS:TRAFFIC, WASTE AND UTILITIES

12.1 Traffic

12.1.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the impact of the Proposed Kilternan Village SHD Development at Wayside, Kilternan Dublin 18 on the surrounding traffic and transportation network and identifies the mitigation measures where required.

This Chapter was prepared by Peter Foley, a Senior Transport Consultant with Atkins Transport Group. Peter has over 13 years' post graduate experience in his field. He graduated from Heriot Watt University with a Masters in Urban and Regional Planning in 2007. His area of expertise includes transport planning, assessing the transport impacts of developments projects and developing transport strategies. His experienced includes all project stages from planning through to implementation. He has worked with Atkins since 2020.

The site location and project description are detailed in Chapter 2 Description of Development of this EIAR. Key elements and transport related infrastructure are summarised below.

12.1.1.1 The Project

This Chapter sets out the impacts of the traffic and transportation proposals associated with the development at Wayside, Kilternan and includes consideration of cumulative impacts of other key development sites in the Kilternan Environs as well as assumed background growth in traffic.

The following are relevant to note in relation to the development proposal in terms of traffic and transport:

- The development lands form part of the Kilternan / Glenamuck Local Area Plan (LAP). To facilitate the development of the LAP lands DLRCC proposes the delivery of the Glenamuck District Roads Scheme (GDRS) to improve the areas multi-modal transport infrastructure. The GDRS was developed in collaboration with the National Transport Authority (NTA) and a Traffic Modeling Report (2013) examined the capacity of the local transport network and identified the necessary infrastructure required to facilitate the sustainable development of the all the LAP lands, including the Liscove Lands. Therefore, it is important to note that the transport impact of this proposal has been considered and accounted for at the macro level;

- The proposal is for a Strategic Housing Development that includes residential, retail, commercial and community facilities. The mixed-use nature of the development and the design of the masterplan in accordance with Design Manual for Roads and Streets (DMURS) principles will help to encourage active travel and reduce the need to drive in accordance with the "15 Minute City Principles";

- There are reasonably good public transport facilities available adjacent to the site, including a number of bus services with linkages to the Luas at Carrickmines (Ballyogan Wood Luas Stop). Future public transport proposals including bus priority measures associated

with the delivery of the GDRS will provide journey time improvements to bus journey, further enhancing the attractiveness of this mode for future residents, visitors and users of the development;

- A masterplan has been prepared for the lands at Wayside, Kilternan in control of the Applicant. The masterplan layout has been developed to comply with the Design manual for Urban Roads and Streets (DMURS) principles that prioritise walking and cycling and to minimise any adverse impact of private car use;

- The development provides for a number of vehicular and multi-modal access points onto the existing and proposed road network including 3 no. access points to the west onto Enniskerry Road frontage, an access to the north onto Glenamuck Road frontage and to the east onto Glenamuck Link Distributor Road (GLDR) that forms part of the GDRS. The distribution and number of access points will facilitate a dispersal of development related traffic and as well as providing an appropriate level of permeability;

- The masterplanning of the lands takes into account external connections to adjoining lands and transport facilities ensure that permeability and desire lines are accounted for;

- There is extensive internal walking and cycling infrastructure including a mixture of fully segregated pedestrian and cycle routes through the masterplan lands;

- Car and cycle parking provisions align with Dun Laoghaire Rathdown County Development Plan (DLRCC) Development Plan (2022-2028) and or Design Standards for new Apartments (DSFNA) produced by DHLGH (2020). The levels of car parking are appropriate for the site location and the level of public transport services available so as to strike an appropriate balance between car parking provision and encouraging sustainable travel by future residents and users;

- The mixed use development will be delivered in a phase manner with a total of 5 phases proposed;

- The development including its transport planning infrastructure has been developed in a collaborative manner between the design team in liaison with other stakeholders including DLRCC and NTA;

- In January 2021 the National Remote Work Strategy was published by the Department of Enterprise Trade and Employment which lays out the long-term strategy to promote home and remote working for public sector and private sector employees. The strategy mandates that 20% of the public sector workforce move to home and remote working in 2021. Furthermore, the strategy notes that more than 25% of the private sector workers in Ireland are capable of working remotely.

- Therefore, in addition to the significant opportunities to travel to work by active travel and public transport modes, residents of the Kilternan Village SHD development may avail of the home and remote working opportunities, including flexible working opportunities, as promoted by the National Remote Work Strategy. This change in work practice will reduce overall work trips and optimise flexible working opportunities that will enable residents to

avoid travel to work and to also facilitate residents to commute to their place of employment outside of the peak traffic and travel periods.

- In overall terms, the Kilternan Village SHD development will be fully consistent with the National Planning Framework objective of compact growth in a location that will optimise the residents' opportunities to travel by active travel and public transport modes, fully consistent with the overall objectives of the NTA Greater Dublin Area Transport Strategy.

The development therefore presents as an exemplar of integrated land use and transportation planning that is fully consistent with the 'Avoid - Shift -Improve Model' as set out in the Dun Laoghaire Rathdown Development Plan (2022-2028) which is based on avoiding or reducing the need to travel, shifting to more environmentally friendly modes and improving the efficiency of motorised transport modes.

In this context, and in the more general context of rapidly changing lifestyles and work patterns it is anticipated that the impact of the Proposed Development on the existing road network will be modest and well within the carrying capacity of existing infrastructure.

12.1.2 Study Methodology

12.1.2.1 Assessment Methodology

The methodology for this Chapter was developed using recognised national assessment guidelines[14] and is outlined in the following sections. The assessment was undertaken using desktop research, policy review, geographical information systems (GIS) mapping, site visits, traffic surveys, traffic modelling, public transport usage surveys as well as consultation with relevant stakeholders including DLRCC and NTA.

12.1.2.2 Defining the Study Area

The study area for the traffic and transportation assessment has been established based on the likely areas of influences of the development on various travel modes—such as walking, cycling, public transport and vehicular traffic—and on key travel destinations:

- Walking – the focus is on the provision of walking facilities both within the development and on the pedestrian network adjacent to the site including connections onto and along the Glenamuck Link Distributor Road (GLDR), Glenamuck Road and Enniskerry Road;
- Cycling – the focus is on the provision of cycle facilities both within the development and on the road network surrounding the site including connections onto and along the Glenamuck Link Distributor Road (GLDR), Glenamuck Road and Enniskerry Road;
- Public transport – the focus is on the provision of access to public transport facilities—including services and associated bus infrastructure such as local bus stops and bus priority measures—and any potential impact that traffic could have on public transport service reliability; and

[14] See reference Section 12.1.11

- Vehicular traffic – the focus is on the impact of traffic flows both within the development and at several key junctions and road links surrounding the site and the impact that traffic could have on network performance.
-

12.1.2.3 Defining Significance

The 2022 Environmental Protection Agency (EPA) guidelines included in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports, identify that significance of effects

> *"Is usually understood to mean the importance of the outcome of effects (consequences of the change). Significance is determined by a combination of (objective) scientific and subjective (social) concerns". (section 3 page 49)*

In general, impact significance is defined using a combination of sensitivity (e.g., high, medium and low) of the environmental feature and the magnitude of impact (e.g., major, moderate, slight and negligible).

The criteria for assessing sensitivity and magnitude level have been defined in Table 12-1 and Table 12-2. The overall significance of an impact, taking the relationship between sensitivity and the magnitude level into consideration, is set out in Table 12-3.

The significance level attributed to each effect has been assessed based on the magnitude of change due to the Proposed Development and the sensitivity of the affected receiving environment to change.

12.1.2.3.1 Receptor Sensitivity (or significance)

The criteria for assessing the traffic and transport sensitivity are defined according to the matrix as set out in Table 12-1.

Table 12-1 Sensitivity and Description of Impact

Sensitivity Description of Impacts	Criteria
High	Receptors of greatest sensitivity to change such as highly congested links or junctions, which have a low capacity to accommodate change without significant effect arising.
Medium	Links and junctions which have a moderate capacity to accommodate change without significant effects arising.
Low	Links and junctions which have a high capacity to accommodate change without significant effects arising
Negligible	Receptors with low sensitivity to traffic flows, those sufficiently distant from affected links and junctions and those that are very lightly used (relative to other modes within the study area) which have a very high capacity to accommodate change without significant effects arising.

12.1.2.3.2 Magnitude of Impact

The criteria used to assess the magnitude of change are set out in Table 12-2. These criteria were used to identify the magnitude of change for quantitative assessment and were supported by professional judgement to take full account of the specific context in the study area.

Table 12-2 Magnitude of Impacts Assessment Criteria

Magnitude of Impacts	Criteria
High / Major	Changes which are perceptible and would result in significant alterations to conditions.
Medium	Changes which are perceptible and would alter conditions which otherwise prevail.
Low / Small	Changes which are perceptible but would not alter conditions which otherwise prevail.
Negligible	Changes that is unlikely to be perceptible.

12.1.2.3.3 Significance of Impact and Typical Description

The 2022 EPA guidance on information to be contained in EIAR has been used to categorise the significance of impact as shown in Table 12-3.

Table 12-3 Significance of Effect Description

Significance of Effect	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 Effects	An effect which causes noticeable changes in the character of the environment without affecting 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	An effect which, by its character, magnitude, duration and intensity significantly alters most of a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of sensitive aspects of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.
Neutral	No effect or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

12.1.2.3.4 Traffic and Transport Impact Matrix

The significance of effects for the traffic and transport assessment of the Proposed Development was based on the receptor sensitivity and the magnitude of impact. This is defined in Table 12-4.

Table 12-4 Traffic and Transport Significance of Effect Matrix

Heading	Existing Environmental (significance / Sensitivity)			
Magnitude of Impact	High	Medium	Low	Negligible
High	Profound	Very Significant	Moderate / Slight	Not Significant
Medium	Very Significant	Moderate	Moderate / Slight	Slight / Not Significant
Low	Significant / Moderate	Moderate / Slight	Slight / Not Significant	Not Significant
Negligible	Not Significant	Not Significant	Not Significant	Imperceptible

Effects are generally considered significant (and in need of mitigation) if they are profound, very significant, significant or moderate. Slight and imperceptible effects are not considered to be significant.

Effects have been described as:

- Beneficial, neutral or adverse;
- Permanent or temporary; and
- Short (< 5years), medium (5-10 years) or long term (10+ years).

Temporary effects are those associated with the demolition and construction activity, while permanent effects are those associated with the operation of the development.

12.1.2.4 Baseline Transport Review

A baseline transport review was completed via a desktop review of current planning policies and objectives, existing public transport services, the walking and cycling network and existing road infrastructure. This also included a review of relevant committed developments in the vicinity of the Proposed Development site.

12.1.2.5 Traffic Surveys

As the part of the preliminary analysis, traffic count data undertaken in November 2018 that formed part of the EIAR for the Glenamuck District Roads Scheme was used to assess background traffic flows on the surrounding road network. This was done due to impact of COVID-19 on travel patterns and traffic. This approach was discussed with and agreed with Adrian Thompson the Senior Transport and Roads Engineer DLRCC.

However, a new JTC (Junction Turning Count) survey was undertaken in November 2021 for the key junctions. Initially a comparison was drawn between traffic data obtained in 2018 to determine the impact of Covid-19 restrictions on the general traffic on the road network.

Due to the COVID – 19 pandemic and associated restrictions, the general traffic on the road network was at a reduced level during the survey time as compared to the pre-COVID scenario. Therefore, in order to determine the impact of Covid-19, a comparison was carried out between the traffic counts undertaken in November 2018 and in November 2021. These are set out in the Table 12-5 for the key junctions.

Table 12-5 Comparison of Traffic Survey Data

Junction	12-hour (7am to 7pm) PCU volume for 2018	12-hour (7am to 7pm) PCU volume for 2021	Ratio (2021:2018)
Enniskerry Road/Glenamuck Road Junction	10285	10881	1.05
Enniskerry Road/R116 Junction	8775	8524	0.97
Enniskerry Road/Ballycorus Road Junction	6873	6619	0.96

Due to the COVID-19 pandemic and associate restrictions, there has been an accelerated transition to remote and home working and education. In response to this the National Transport Authority (NTA) have produced a report titled '*Alternative Future Scenario for Travel Demand'* to research the potential impact on travel behaviour and patterns post Covid-19. Based on this report, an alternative scenario is predicted for the future in which a significant reduction in the total number of trips on the transport network (approximately 8% lower than previous projections, i.e., 92% of the pre-Covid scenario) could be expected. This is shown by the orange line in the Figure 12-1 provided below.

Furthermore, in January 2021, the National Remote Work Strategy was published by the Department of Enterprise, Trade and Employment. This document lays out the long-term strategy to promote home and remote working for public sector and private sector employees. The strategy mandates that 20% of the public sector workforce move to home and remote working in 2021. The strategy notes that more than 25% of the private sector workers in Ireland are capable of working remotely.

Based on the above documents, it is considered that the application of an 8% reduction in traffic volumes from the pre-COVID 19 period due to the transition of the work force to remote and home working is both a reasonable and conservative assumption of future travel demand projections.

Based on Table 12-5, the traffic on the network during which time the surveys were undertaken was found to be in the order of around 95-105% of the traffic before the COVID19 restrictions. Hence, the traffic represents the baseline travel demand in the post-COVID scenario and therefore, no modification to the baseline traffic survey counts was carried out for the analysis.

Figure 12-1 Growth in number of trips per day (NTA National Forecasting Model)

Traffic surveys were commissioned and undertaken by NDC on November 11, 2021 on behalf of the applicant. The survey included Junction Turning Counts survey for the key junctions summarised in the Figure 12-2. The survey was undertaken between 07:00 am to 07:00 pm for 12 hours.

Based on the survey data following peak hours were determined:

- **AM Peak:** 8am to 9am
- **PM Peak:** 4pm to 5pm

These traffic counts have been collected in fifteen-minute intervals and were classified into four vehicle categories of Car, Light Vehicles (LV), Heavy Vehicles (HV) and bus. These vehicle counts have been converted to Passenger Carrier Units (PCU) as follows:

- Car = 1.0 PCU
- LGV = 1.0 PCU
- OGV1 = 1.5 PCU
- OGV2 = 2.3 PCU
- PSV = 2.0 PCU

- M/C = 0.4 PCU
- P/C = 0.2 PCU

Figure 12-2 Location of key junctions for JTC Survey (November 2021)

12.1.2.6 AADT

The AADT figures have been calculated utilising the methodology outlined within TII PAG Unit 16.1 - Expansion Factors for Short Period Traffic Counts (PE-PAG-02039). Future traffic growth and Proposed Development traffic generation has also been taken account for the future design years.

12.1.2.7 Trip Rates and Trip Generation

The TRICS database was utilised to determine the multi-modal trip generation for the proposed mixed use residential and neighbourhood centre development for both AM and PM Peak.

12.1.2.8 Mode Share

The likely modal split was determined from the 2016 census data for similar areas in the vicinity using CSO data cross reference to TRICS data.

12.1.2.9 Assessment of Road Impact

12.1.2.9.1 Operational Phase

An assessment of the impact of the development on key links and junctions was undertaken for base, opening year, opening year +5 and opening year +15 for with and without development scenarios in order to determine the future operation and any necessary mitigation measures required.

12.1.2.9.2 Construction Phase

Undertake an assessment of the potential traffic generation during the construction phase and assess the percentage traffic impact likely to occur and to identify any appropriate mitigation.

12.1.2.10 Traffic Modelling Impacts

An initial assessment was undertaken to quantify the additional traffic from the development that will be distributed onto the local road network and the potentially impacted junctions. In order to determine what level of increase is considered above threshold, reference is made to the TII Traffic and Transport Assessment Guidelines (May 2014). This document outlines the following thresholds:

- Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road; and,
- Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive.

In the context of the urban road environment in the vicinity of the development it was considered appropriate to apply the 5% threshold. Junctions which are predicted to be impacted by an increase in traffic in excess of 5%, due to development traffic, were considered for further detailed junction assessment and modelling.

12.1.2.11 Public Transport Impact

A survey was undertaken of existing boarding and alighting from bus stops in the vicinity of the development and at Ballyogan Wood Luas stop during the AM and PM peak periods. Using mode share data obtain from TRICs and Census future peak public transport trips were estimated and the impact on existing and future bus and rail capacities was determined.

12.1.2.12 Accident Data

This consisted of a review of the most up to date accident data as contained in the Road Safety Authority's web page[15] to understand any patterns or trends.

[15] https://www.rsa.ie/en/RSA/Road-Safety/RSA-Statistics/Collision-Statistics/Ireland-Road-Collisions/

12.1.2.13 Future Transport Infrastructure Review

This consisted of a review of current proposed future transport plans, strategies and infrastructure in the vicinity of the site in order to identify future short, medium and long terms transport proposals which may have a material impact on the travel behaviour associated with the Proposed Development.

12.1.2.14 Development Proposal Review

This review took account of the Proposed Development in terms of provision for access by walking, cycling, public transport and by vehicles including private car and service and emergency access.

12.1.3 The Existing and Receiving Environment (baseline Situation)

The general site context and characteristics is described in Chapter 2, Description of Development, of this EIAR. The Proposed Development site is located towards the southern end of Glenamuck Road. The site is bounded to the north by the Glenamuck Road and an existing built area, to the west by the Enniskerry Road (R117) and to south by an existing residential dwelling. To the west the site is bounded by existing agricultural lands. The developable site area is approximately 10.8 hectares. The location of the site is shown in Figure 12-3.

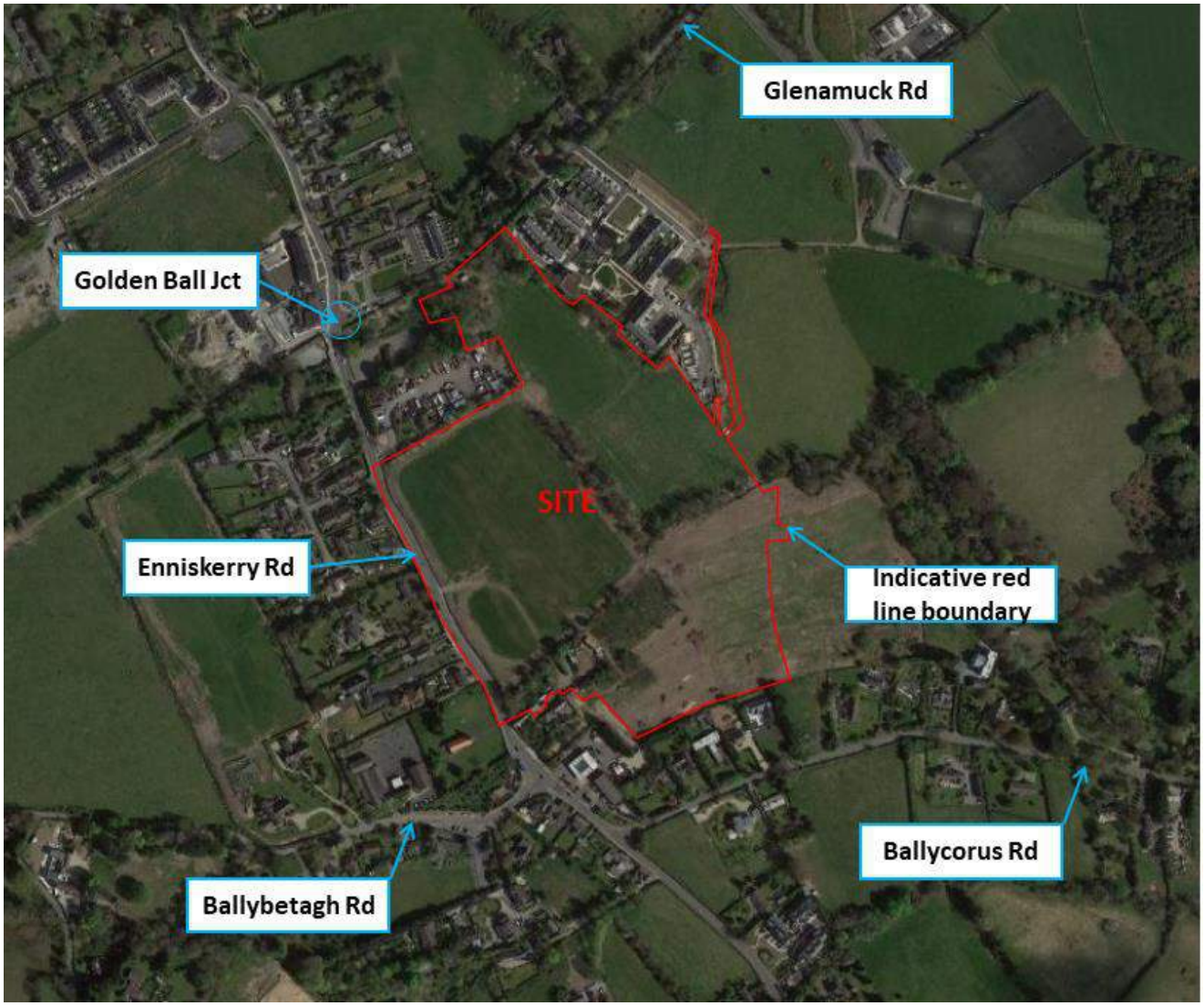

Figure 12-3 Site Location

12.1.3.1 Walking and Cycling Infrastructure

The existing walking and cycling infrastructure are detailed in the following sections.

12.1.3.1.1 Walking facilities

Footpath provision in general is adequate on surrounding roads with most offering footpaths of ample width on both sides of the carriageway.

A footpath is provided on the south side of Glenamuck Road from Cromlech Close at its southwestern end to Carrickmines Manor at its northern end. Footways are provided on both sides of Glenamuck Road in vicinity of its junction with the Enniskerry Road and from Carrickmines Manor to Ballyogan Road / Glenamuck Road North Roundabout.

Crossing facilities at the junction of Glenamuck Road and Enniskerry Road at the Golden Ball Pub are signal controlled pelican crossings. Crossings located at Glenamuck Road North Roundabout and the junction with Ballyogan Road to the north of Glenamuck Road are generally uncontrolled with dropped kerbs.

Footpaths are provided on both sides of the Enniskerry Road from its junction with the Glenamuck Road to its junction with the Ballycorus Road. An uncontrolled crossing is provided on the Ballybetagh Road in vicinity of its junction with the Enniskerry Road, in addition to a signal-controlled pelican crossing on the Enniskerry Road also in close proximity. A signal-controlled pelican crossing is also provided on the Ballycorus Road as part of its junction with the Enniskerry Road.

Figure 12-4 illustrates walking times from the site radiating outwards in 5 minute isochrones that shows the range of facilities, services and amenities that are currently within easy walking distance of the site. Maximum preferable walking distances can be achieved to key destinations such as Stepaside Village, The Park Carrickmines and the Ballyogan Wood Luas Stops.

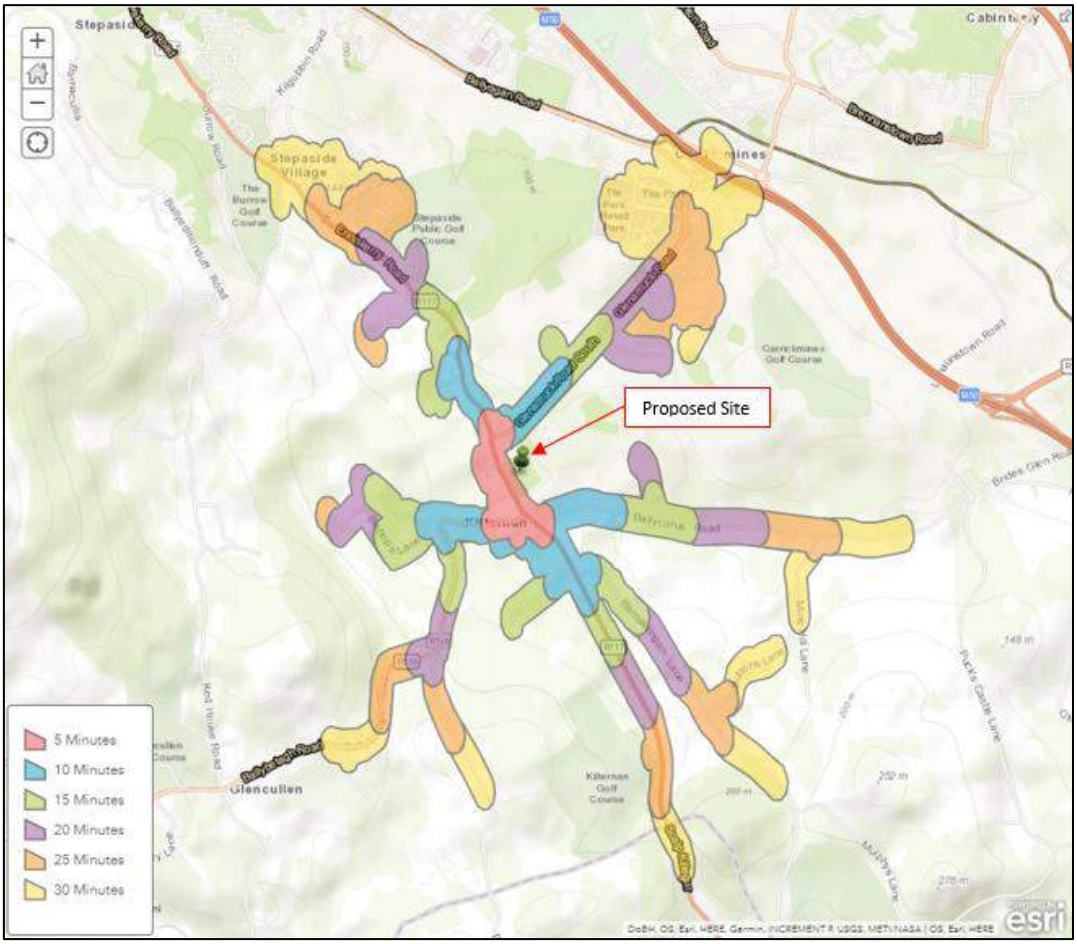

Figure 12-4 Visualisation of 5 Minute Isochrones

12.1.3.1.2 Cycling Facilities

In general cycle facilities provision is provided on the road network shared with vehicles traffic (i.e. Not segregated).

The existing cycling network has been assessed through the generation of cycling isochrones for a maximum cycling time of 20 minutes. Figure 12-5 illustrates cycling times from the site radiating outwards in 5 minute isochrones. Within 15 minutes all local amenities can be reached, including Stepaside Village, The Park Carrickmines and the Ballyogan Wood and Carrickmines Luas Stops.

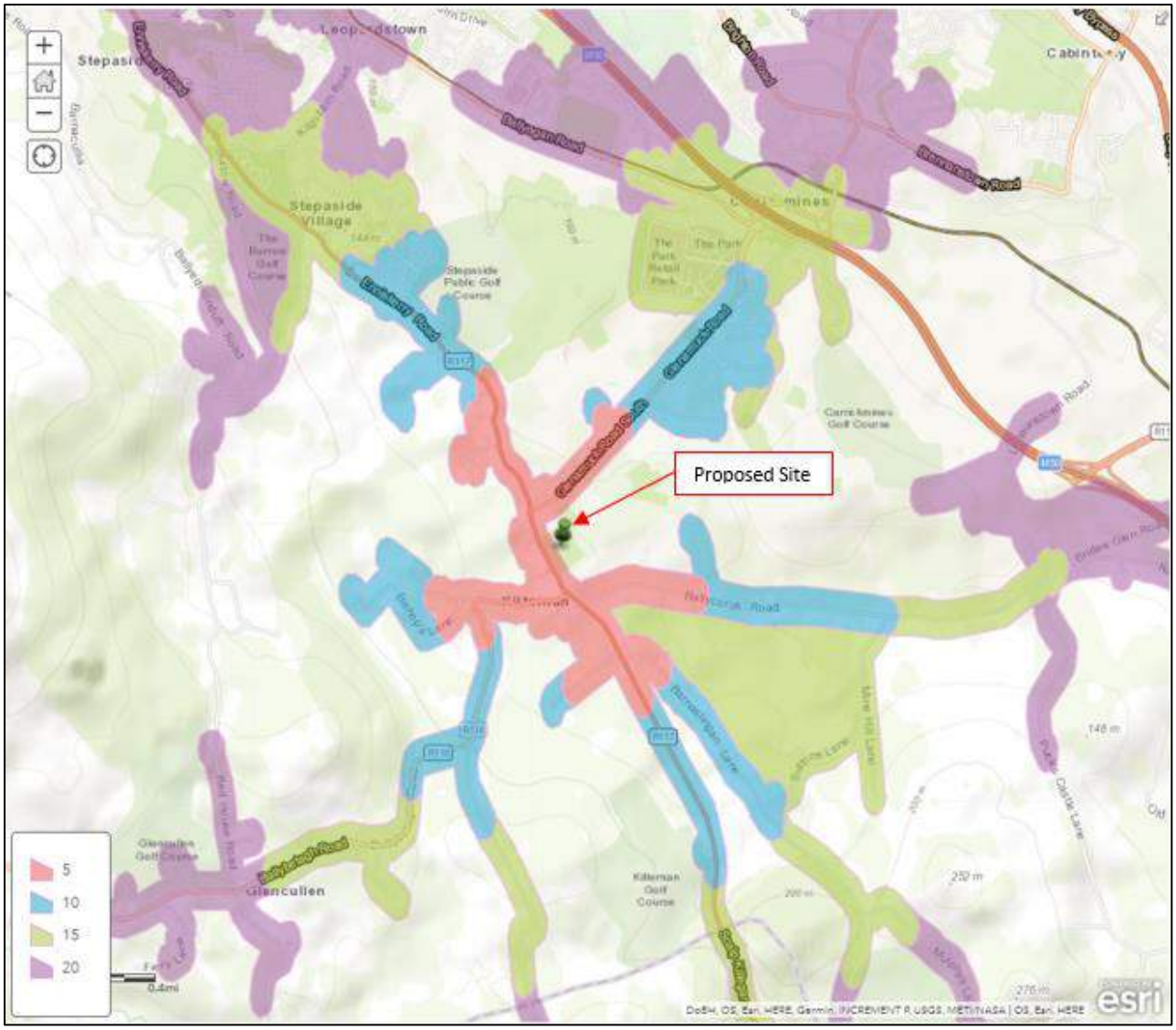

Figure 12-5 Visualisation of 5 Minute Cycling Isochrones

12.1.3.2 Public Transport

The following section outlines the existing public transport facilities in the vicinity of the site. Figure 12-6 shows the location of existing bus and Luas services in relation to the Proposed Development site.

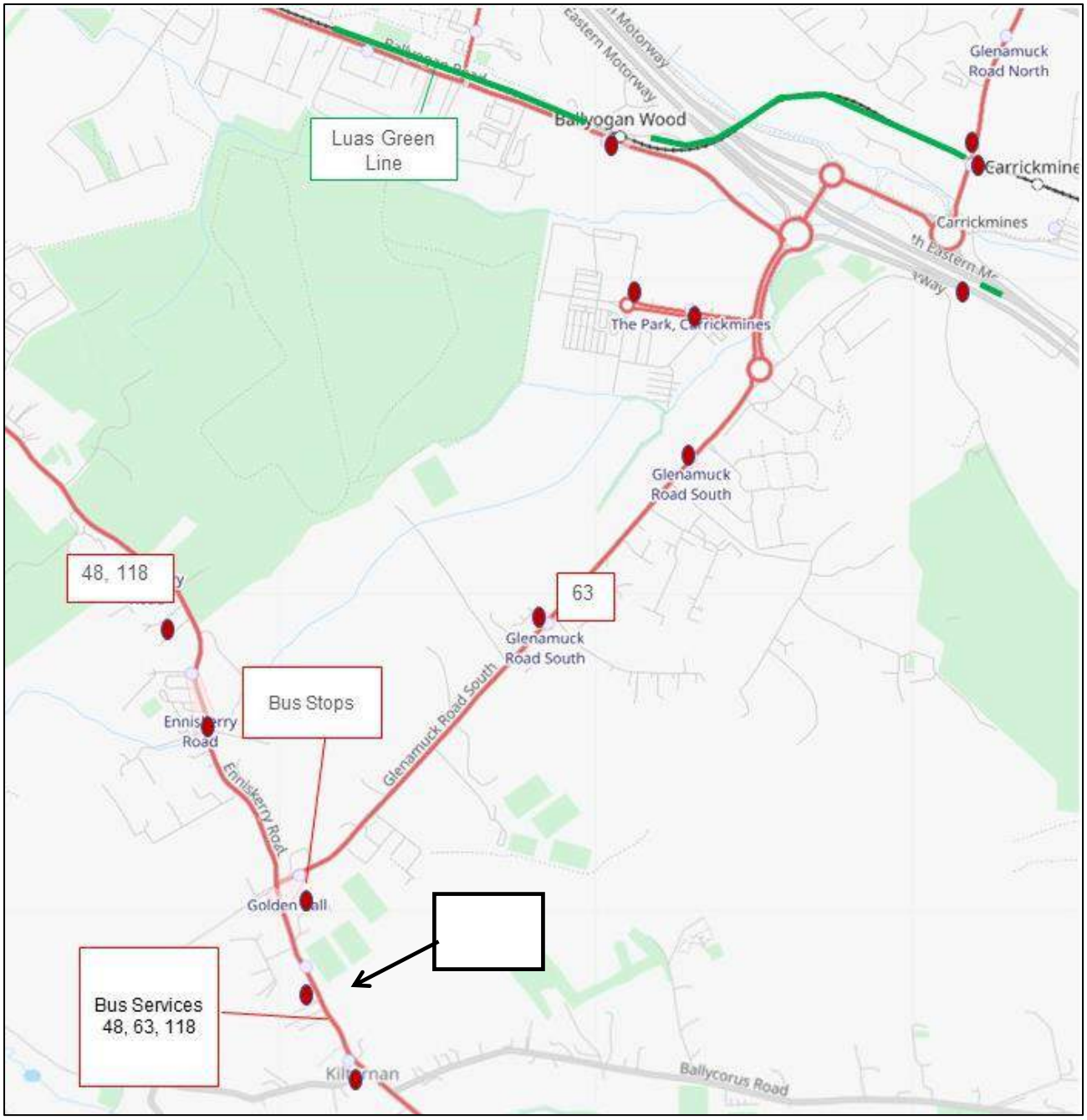

Figure 12-6 Existing Public Transport Facilities in the vicinity of the site

12.1.3.2.1 Bus Services

The following bus services, shown in Table 12-6, operate adjacent to the site and within the optimal 400m of all areas of the proposed development. of the Proposed Development site. Table 12-6 outlines the specific operational details associated with each service.

- The 63 Dun Laoghaire to Kilternan;
- The 44 Townsend Street to Enniskerry;
- The 118 D'Olier Street to Kilternan.

Table 12-6 Existing Bus Services

Bus Stops	Route			Services Per Day		
	Number	Start	Destination	Mon-Fri	Sat	Sun
3279 (Glenamuck Road)	63/63A	Dun Laoghaire	Kilternan	34	34	30
3284 (Kilternan Road)		Kilternan	Dun Laoghaire	35	34	30
3478 (Kilternan Road)						
3284 (Kilternan Road)	44	DCU	Enniskerry	19	16	14
		Enniskerry	DCU	18	17	15
3478 (Kilternan Road)	118	Kilternan	D'Oiler Street	1	0	0
		D'Oiler Street	Kilternan	0	0	0

12.1.3.2.2 Luas Services

The Luas green line operates from the City Centre to Carrickmines and provides a high quality public transport linkage with key stops at Dundrum and Sandyford. The Ballyogan Wood stop is within 2km distance from the Proposed Development site. This stop is within walking distance of the site and is served by the 63 bus service. Weekday peak hour tram frequencies range from 4 to 14 minutes while Saturday and Sunday frequencies range between 6- and 27-minute intervals. The current tram frequencies are shown in Table 12-7.

Table 12-7 Existing LUAS Services

Northbound			Southbound		
Mon-Fri	Saturday	Sunday	Mon-Fri	Saturday	Sunday
91	72	73	103	76	78

Another Luas station at Carrickmines is located adjacent to Junction 15 of the M50 and is within 2.5km of the Proposed Development and consists of a park and ride facility with capacity for over 350 cars.

12.1.3.3 Local Road Network

The existing local road network is described below. In the context of cycling, cyclists are facilitated on road. As the development of the LAP continues and, in particular, following the completion of construction of the planned GDRS the local roads described below will be changed fundamentally in terms of through traffic volumes and will form key local routes on which cyclists can continue to cycle on road but in the context of reduced traffic volumes and speeds. Figure 12-7 shows the location of the key local road network in the vicinity of the site.

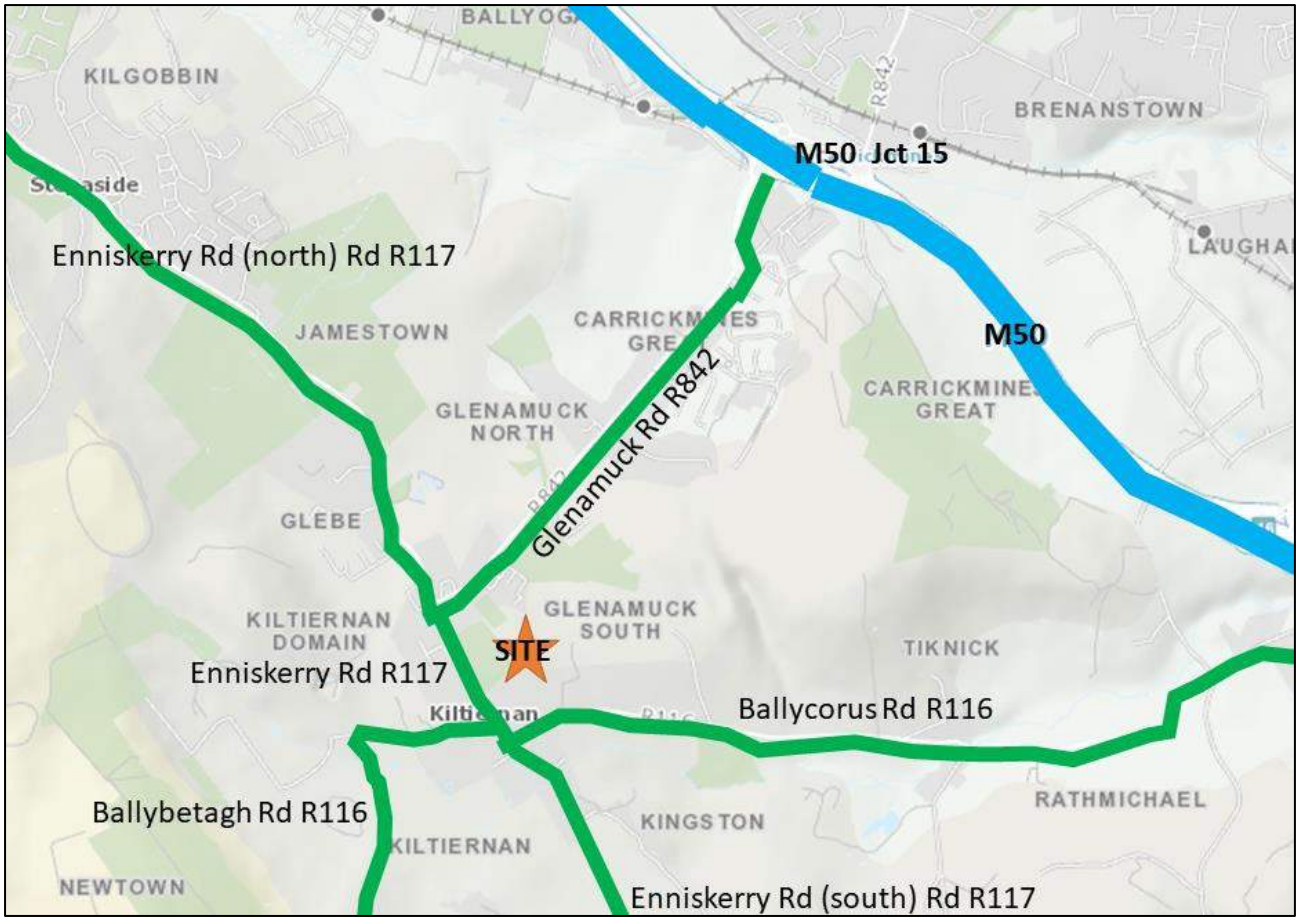

Figure 12-7 Strategic Road Network serving the site

A description of the key roads is provided below.

12.1.3.3.1 Glenamuck Road (R842)

The Glenamuck Road is a classified road (R842) with two traffic lanes (one in each direction) and a 50Kmh speed limit. The road extends for approximately 2km from its intersection with the Enniskerry Road (known as the 'Golden Ball' Junction) at its southwestern extents to the southern roundabout of the Carrickmines Interchange to the northeast. The cross-section of this road varies but is predominantly 6.0m in width. There is a footpath along the southern side of the road, the width of which is varies along its length. There is no footpath along the northern side, however there is a verge of circa 1m width, but again overgrown hedges restrict this width. The development site fronts onto Glenamuck Road from the Golden Balls junction for approximately 100metres[16]. A typical cross section of the Glenamuck Road is shown in Figure 12-8.

Figure 12-8 Glenamuck Road (source: google maps)

12.1.3.3.2 Enniskerry Road (R117)

The Enniskerry Road is a classified road (R117) with two traffic lanes (one in each direction) and a 50Kmh speed limit. The R117 extends from Enniskerry Village in the south to Stepaside Village to the north and intersects with the Glenamuck Road at the 'Golden Ball' Junction. The majority of the road is set in a rural context, with mature trees, hedgerows and stone walls located along the majority of the road. The cross section of the road varies but is predominantly 8.5 m in width in Kilternan. The development site has a long frontage onto the western side of Enniskerry road. A footpath is provided along both sides of the road. Within Kilternan there are a number of existing dwellings fronting both sides of the carriageway. A typical cross section is shown in Figure 12-9.

Figure 12-9 Enniskerry Road (source: google maps)

12.1.3.3.3 Ballycorus Road (R116)

Ballycorus Road is a classified road (R116) with two lanes (one in each direction) with a 50kph speed limit. The R116 extends from its signalised junction with the Enniskerry Road in Kilternan to Rathmichael. The majority of the road is set in a rural context with mature hedges trees etc. and a limited built up frontage. The road has a pedestrian footpath running along its southern side. The cross section of the road varies but is predominantly 6.5 to 7m in width close to Kilternan. A typical cross section is shown on Figure 12-10.

Figure 12-10 Ballycorus Road R116 - Typical Cross Section (source: google maps)

12.1.3.3.4 Ballybetagh Road (R116)

Ballybetagh Road is a classified road (R116) with two lanes (one in each direction) with a 50kph speed limit. The R116 extends from its priority junction with the Enniskerry Road in Kilternan to Glencullen. The majority of the road is set in a rural context with mature hedges trees etc. and a limited built up frontage. The road has a pedestrian footpath on the road near Kilternan but there is no footpath once it goes beyond the built up area. The cross section of the road varies but is predominantly 5.5 to 6m in width close to Kilternan. A typical cross section is shown on Figure 12-11.

Figure 12-11 Ballybetagh Road R116 Typical Road Section (source: google maps)

12.1.3.4 Local Road Junctions

The key junctions in the area of influence of the Proposed Development in terms of potential vehicular traffic impact are illustrated in Figure 12-12 and described in the following sections.

Figure 12-12 Local Road Junctions (source: google maps)

12.1.3.4.1 Enniskerry Road / Glenamuck Road Junction – Golden Ball Junction

The Enniskerry Road / Glenamuck Road Junction (also known as the Golden Ball Junction) operates under traffic signal control with one lane approaches on all arms. Pedestrian crossing facilities are provided on the Enniskerry Road southern arm and the Glenamuck Road arm. The junction also includes an access to the Golden Ball pub carpark and future residential development. Access and egress from this junction onto the Golden Ball junction is via demand control linked to sensors in the signal junction. The existing junction configuration is shown in Figure 12-13.

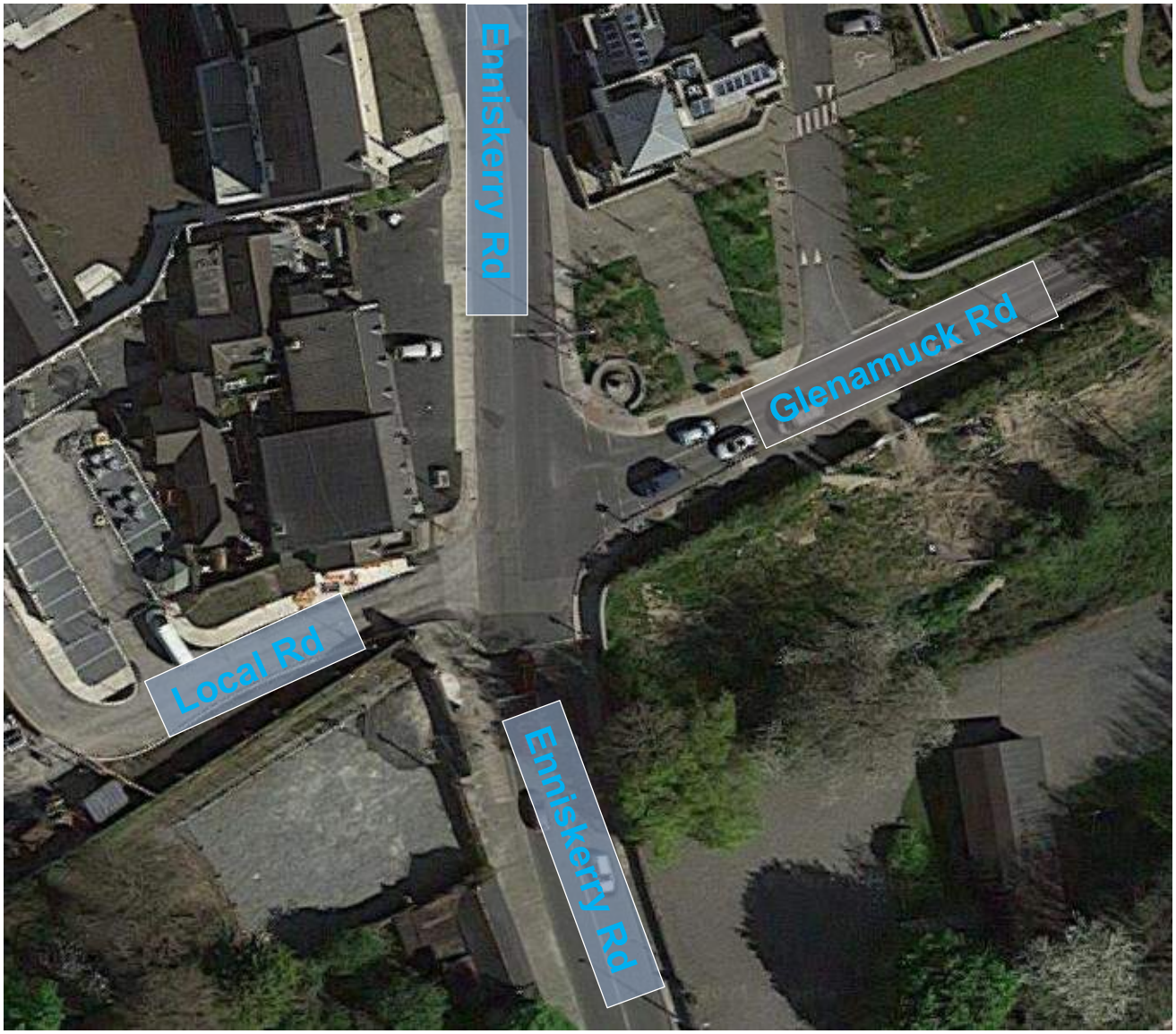

Figure 12-13 Enniskerry - Glenamuck (Golden Ball) Jct (source: google maps)

12.1.3.4.2 Enniskerry Road / Ballybetagh Road Junction

The Enniskerry Road / Ballybetagh Road junction operates as a priority junction. Traffic travelling on the Ballybetagh Road yields to traffic along the major arm of the Enniskerry Road. There are stop road markings and a stop sign in place from this approach. There is a south bound bus stop located along the Enniskerry Road situated directly opposite the Ballybetagh Road arm. A northbound bus stop is located immediately north of the junction also on the Enniskerry Road.

There is an uncontrolled pedestrian crossing located on the Ballybetagh Road arm whilst there is a signal-controlled pedestrian crossing located just south of the junction on the Enniskerry Road arm. Footpaths of nominal width are provided on all sides from all approaches. A petrol station and motor vehicle service centre are located in vicinity of the junction to the right-hand side of Enniskerry Road as one approaches from the south. These premises are served by two adjacent access points onto the Enniskerry Road. The junction is shown in Figure 12-14.

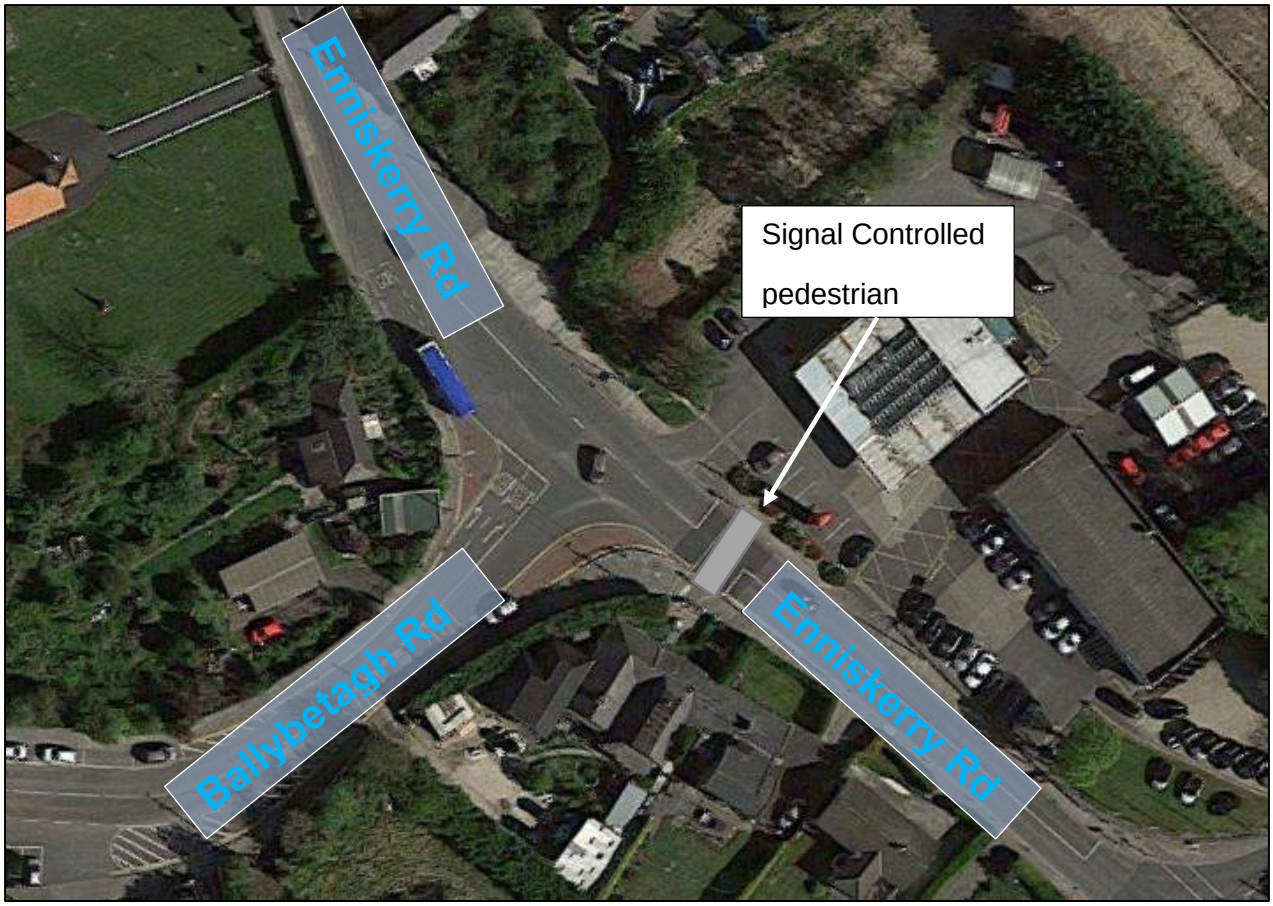

Figure 12-14 Enniskerry- Ballybetagh Jct (source: google maps)

12.1.3.4.3 Enniskerry Road / Ballycorus Road Junction

The Enniskerry Road / Ballycorus Road junction operates under the control of traffic signals. All arms are single lane approaches. A signal-controlled pedestrian crossing is located on the Ballycorus Road arm with dropped kerbs and tactile paving in place. There are no crossing facilities on either of the Enniskerry Road arms. Footpaths of nominal width are provided on all sides from all approaches. The junction is shown in Figure 12-15.

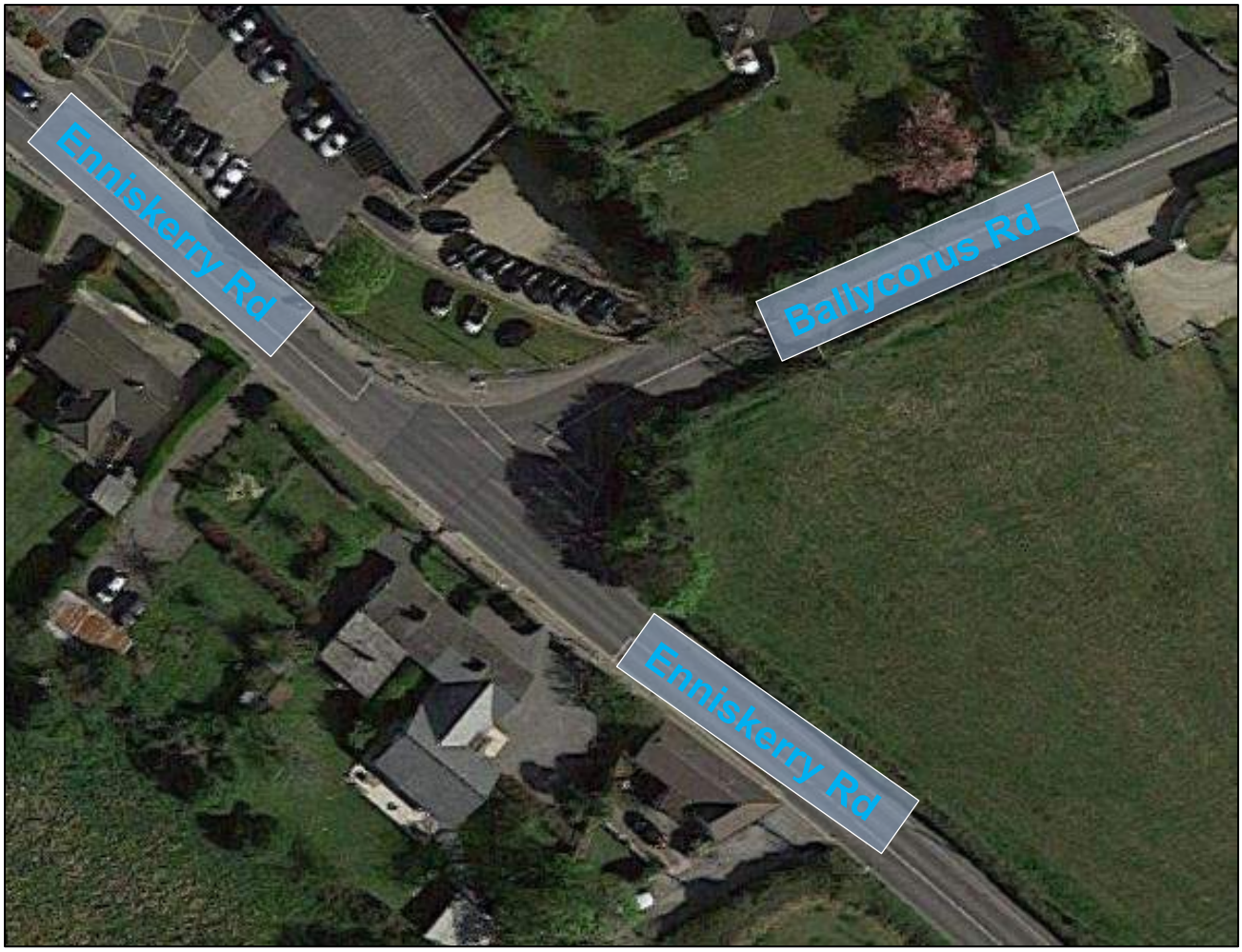

Figure 12-15 Enniskerry Ballycorus Jct (source: google maps)

12.1.3.5 Collisions History

The collision statistics on the Road Safety Authority (RSA) website[17] were reviewed in order to ascertain the safety record in the vicinity of the Proposed Development site over the most recent ten-year period. This includes information for the years 2005 to 2016 inclusive and indicates basic information on all reported incidents.

It should be noted that information relating to reported incidents for the years 2017 to 2020 is not yet available on the Road Safety Authority (RSA) website. The RSA records detail only those occasions where the incident was officially recorded such as the Garda being present to formally record details of the incident.

There has been 10 no collisions within 500m of the Proposed Development site access in the years 2005 to 2016 as outlined in Table 12-8 and shown in Figure 12-16.

[17] https://rsa.ie/RSA/Road-Safety/RSA-Statistics/Collision-Statistics/Ireland-Road-Collisions/

Table 12-8 Collisions record within the vicinity of the site

Year	Accident Type	Accident Details	Casualties
2016	Serious	Car – single vehicle only	1
2014	Minor	Car	1
2013	Minor	Car	2
2012	Minor	Car	2
2011	Minor	Car -single	1
2011	Minor	Car	1
2009	Minor	Goods Vehicle	1
2008	Minor	Motorcycle	1
2006	Minor	Car – single vehicle only	1
2005	Minor	Motorcycle	1

One of the collisions was classed as serious while the remainder were classed as minor. There is no obvious accident pattern such as multiple accidents at a specific location that might indicate a shortcoming in the existing road transport network.

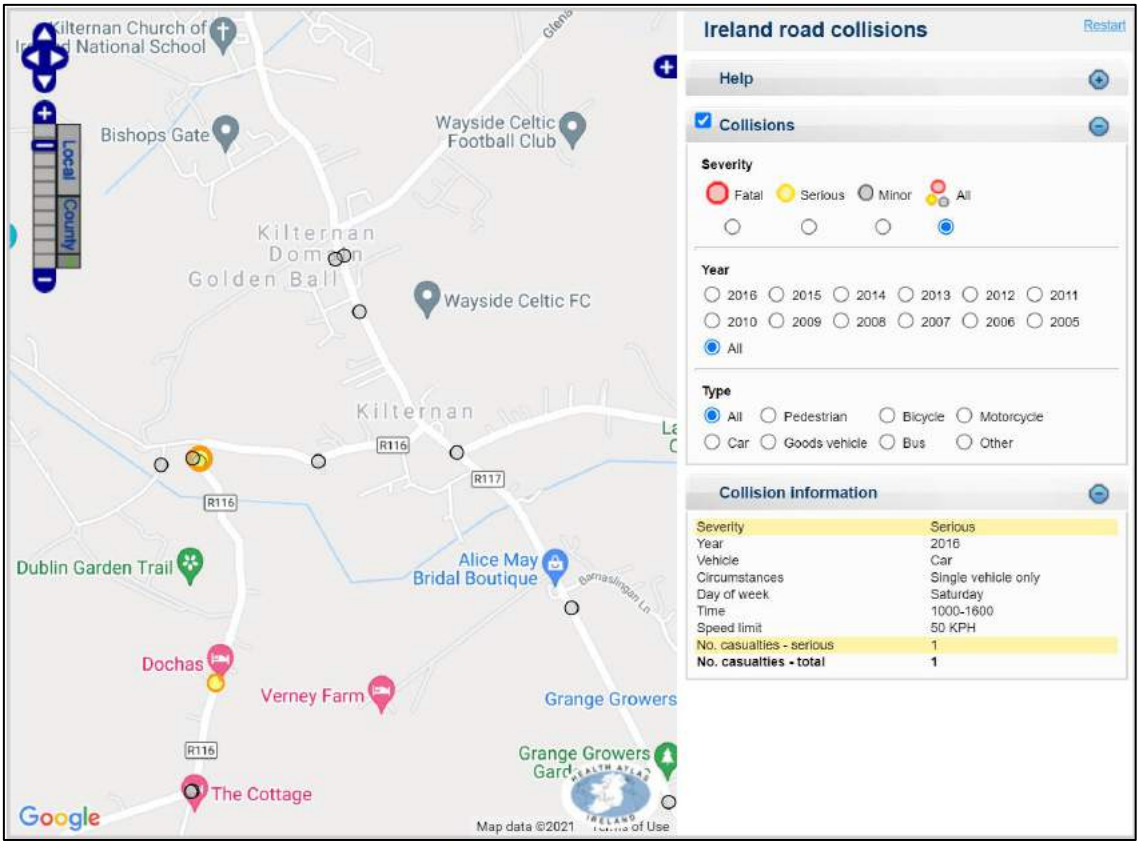

Figure 12-16 Collision Viewer (source RSA.ie)

12.1.3.6 Future Transport Proposal

The following sections outline planned transport infrastructure improvements that will be delivered in the vicinity of the site that will improve access opportunities for future residents and visitors to the site.

12.1.3.6.1 The Glenamuck District Roads Scheme (GDRS)

Dun Laoghaire Rathdown County Council submitted a planning application under section 51(2) of the Roads Act 1993 (as amended by section 9(1)(e)(i) of the Roads Act 2007) for the Glenamuck District Roads Scheme (GDRS) with an associated Environmental Impact Assessment Report (EIAR) to An Bord Pleanála (ABP) in 2019. The Scheme was granted permission by ABP in December 2019 (ABP Ref. ABP-303945-19).

The GDRS is made up of the Glenamuck District Distributor Road (GDDR) and the Glenamuck Link Distributor Road (GLDR).

The Glenamuck District Distributor Road (GDDR) connects from the Enniskerry Road adjacent to De La Salle Palmerstown Rugby Club to a tie in at the Glenamuck Road East/Golf Lane Roundabout. The Glenamuck Link Distributor Road (GLDR) connects from the approximate midpoint of the GDDR to the Enniskerry Road south of Kiltiernan and will connect the new distributor road with the existing Glenamuck Road, Ballycorus Road and Barnaslingan Lane providing an alternative to the Enniskerry Road for north-south travel. The GDRS scheme is shown in Figure 12-17.

Figure 12-17 GDRS Scheme in wider context

The GDRS has been designed with DMURS principles as link streets and a design speed of 50kph. The scheme provides excellent facilities for pedestrian and cyclists throughout its length with generous paths and segregated cycle facilities to encourage active travel. Junctions across the scheme have been designed in accordance with the National Cycle Manual to ensure cyclist safety is maintained across the scheme.

Bus priority measures including the provision of bus only lanes and bus gates have been incorporated to improve bus journey time reliability at both a local and larger scale as shown in Figure 12-18.

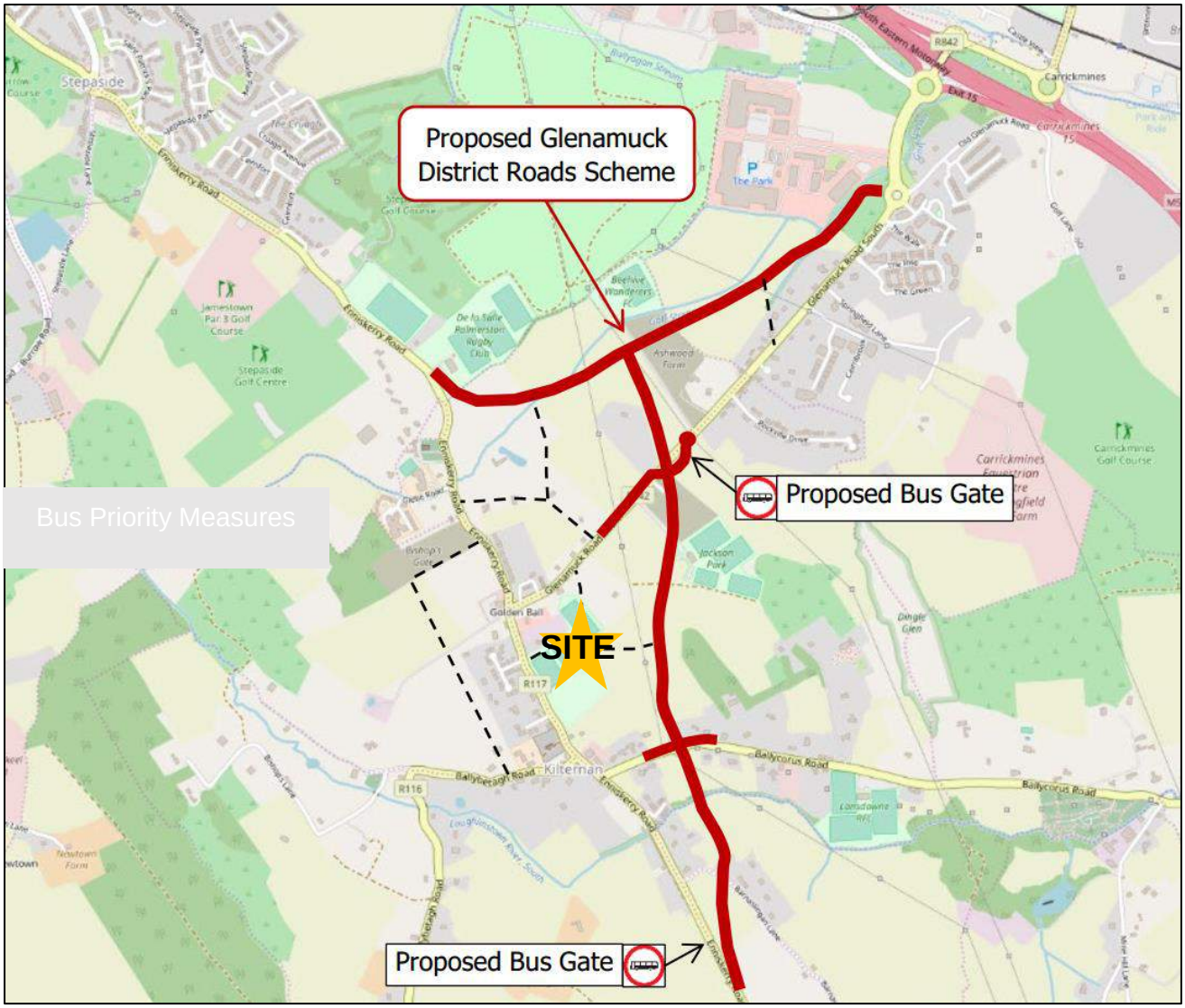

Figure 12-18 GDRS - Wider Bus Priority Measures

The two bus gates located at the GLDR/ Enniskerry Road junction and on the eastern arm of the GLDR/ Glenamuck Road as shown on the left and right of Figure 12-19.

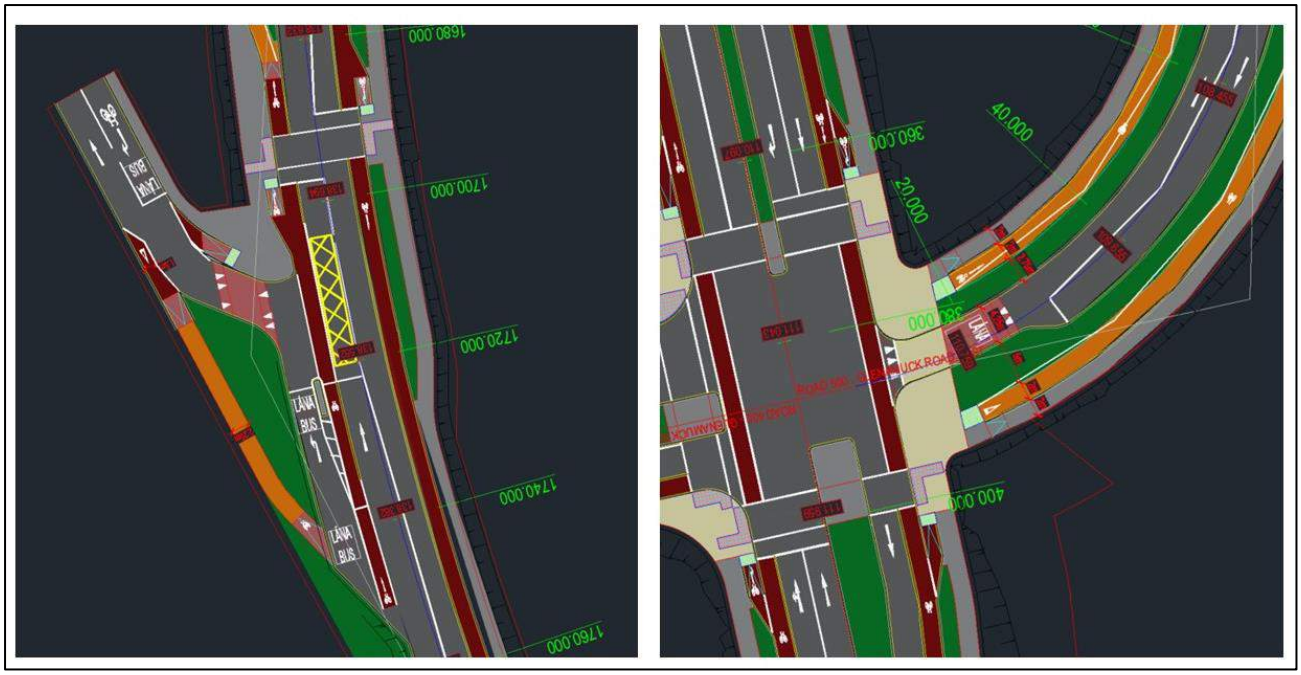

Figure 12-19 Bus Gates on GDRS

The cross section along the scheme varies as shown in Figure 12-20, with those typical sections' layouts A-A to D-D shown in Figure 12-21.

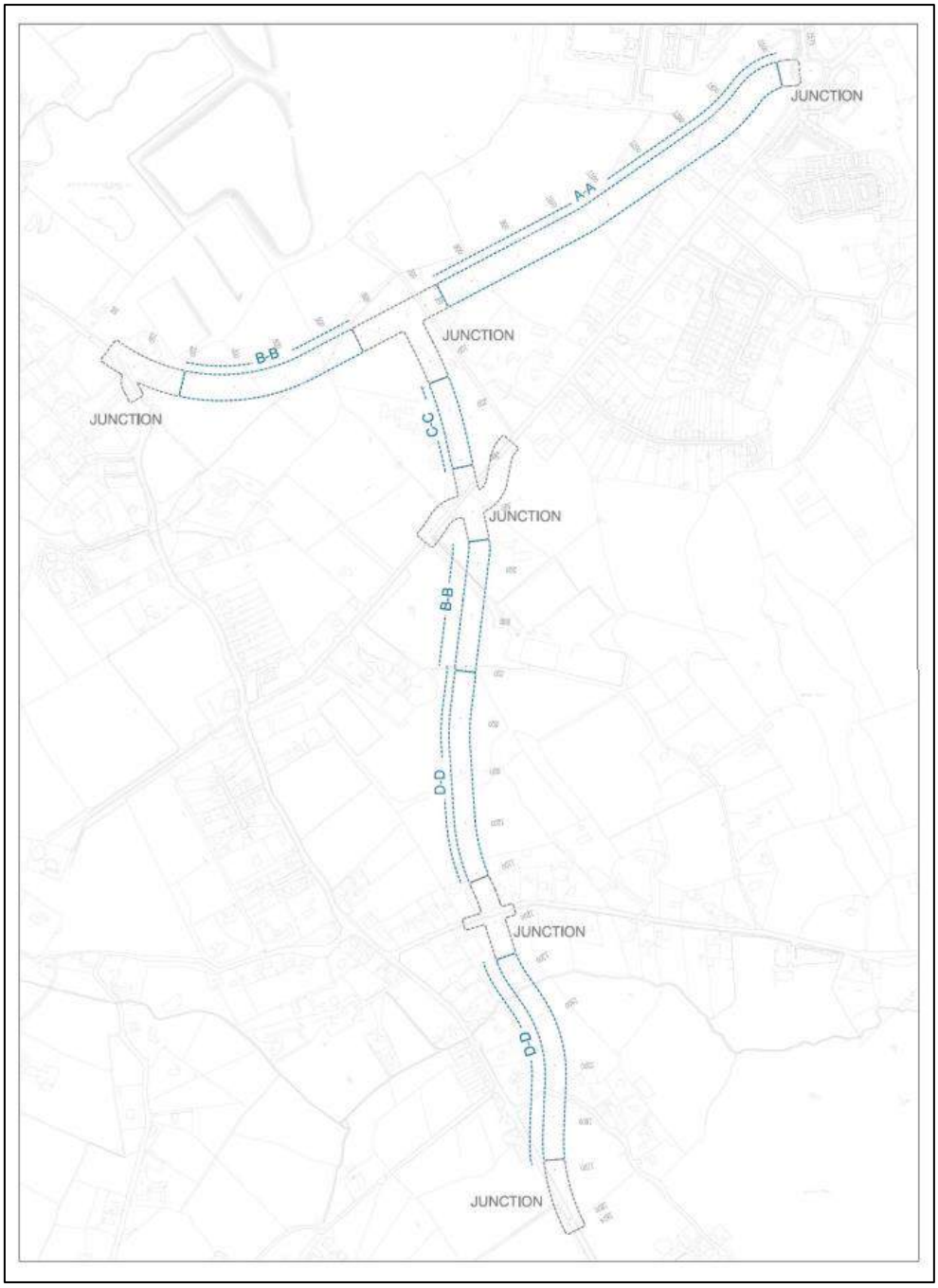

Figure 12-20 Typical Cross Section along GDRS (source: GDRS EIAR)

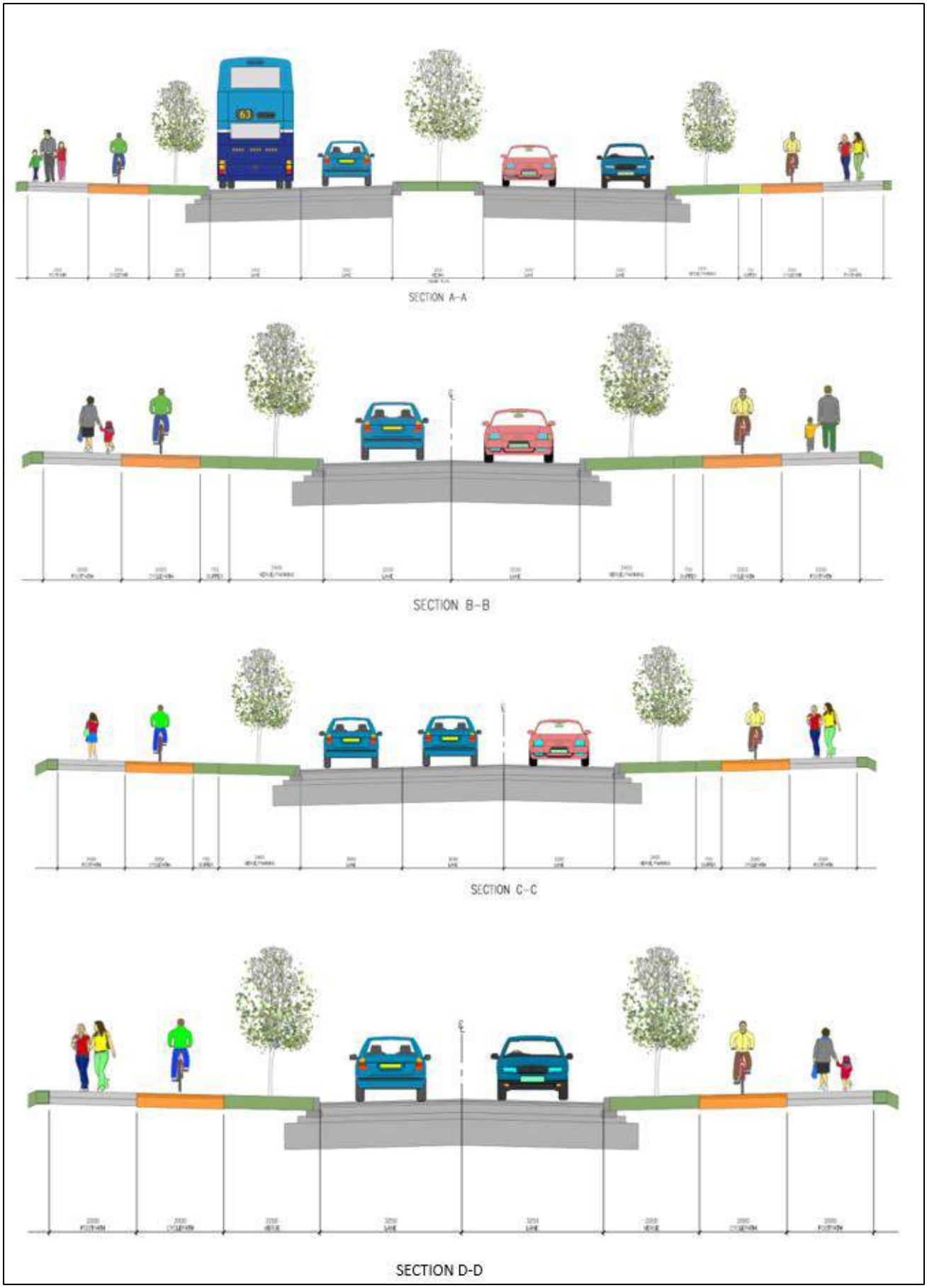

Figure 12-21 GDRS Typical Sections Layouts (source: GDRS EIAR)

12.1.3.6.2 Glenamuck Road / Enniskerry Road Junction Upgrade Scheme – Golden Ball Junction

The upgrade of the Enniskerry Road / Glenamuck Road Junction Upgrade Scheme was approved by Dún Laoghaire-Rathdown County Council under Part 8 (DLRCC Ref - PC/IC/01/17) of the Planning and Development Regulations[18].

The approved Part 8 scheme incorporates the following:

- Glenamuck Road approach to junction: provision of left and right turning lanes;
- Enniskerry Road - southern approach to junction – provision of new right turning lane;
- Improved pedestrian crossings incorporated within signalised junction including new crossings on the northern and western sides of Enniskerry Road;
- Cycle lanes / cycle tracks on Glenamuck Road;
- General upgrading of the junction to provide improved pedestrian and cycle facilities;
- Removal of the pinch-point on Glenamuck Road adjacent to Cromlech Close; and
- Upgraded public lighting.

An extract of the approved Part 8 scheme is shown Figure 12-22.

[18] https://www.pleanala.ie/anbordpleanala/media/abp/cases/orders/300/d300731.pdf

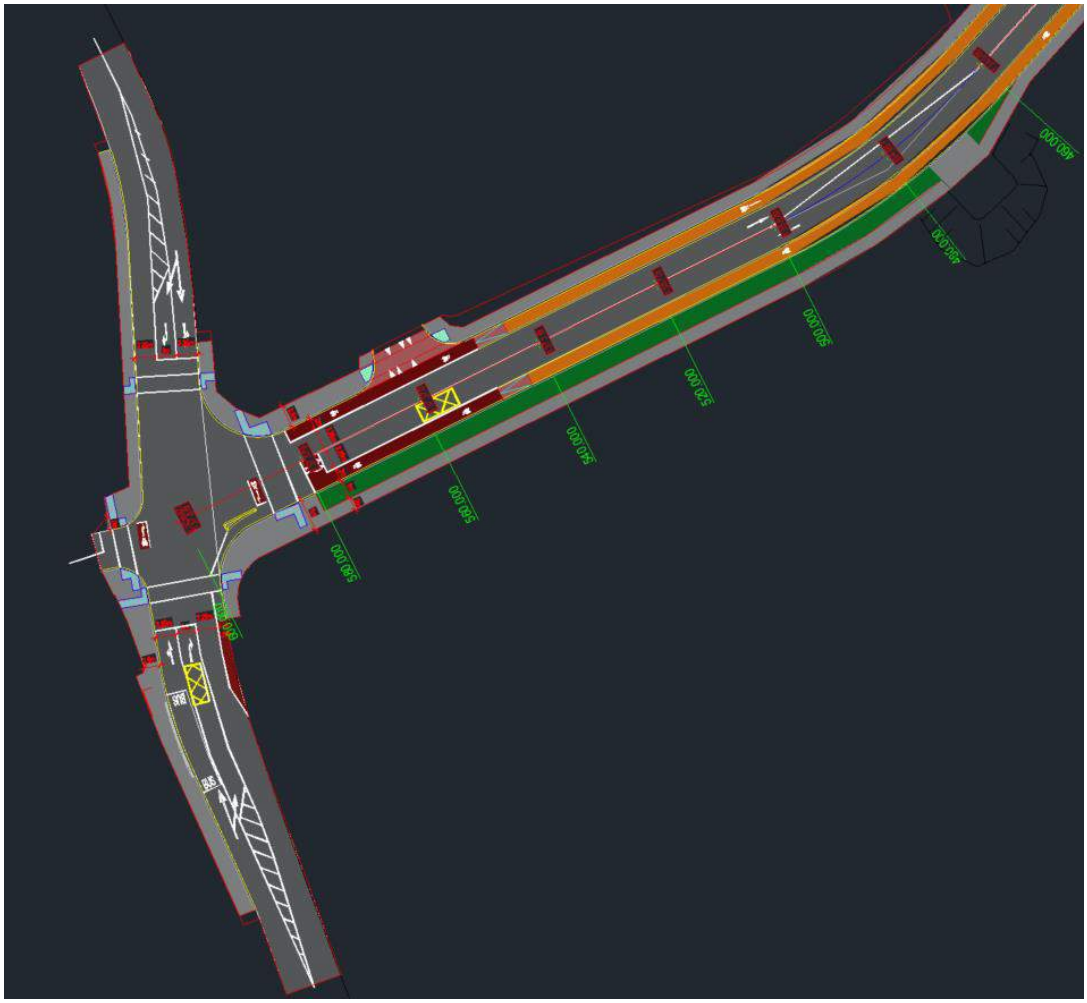

Figure 12-22 Enniskerry / Glenamuck Part 8 Scheme

Figure 12-23 is an extract from the Kilternan Local Area Plan, illustrates the alignment of these roads and the position of the development lands.

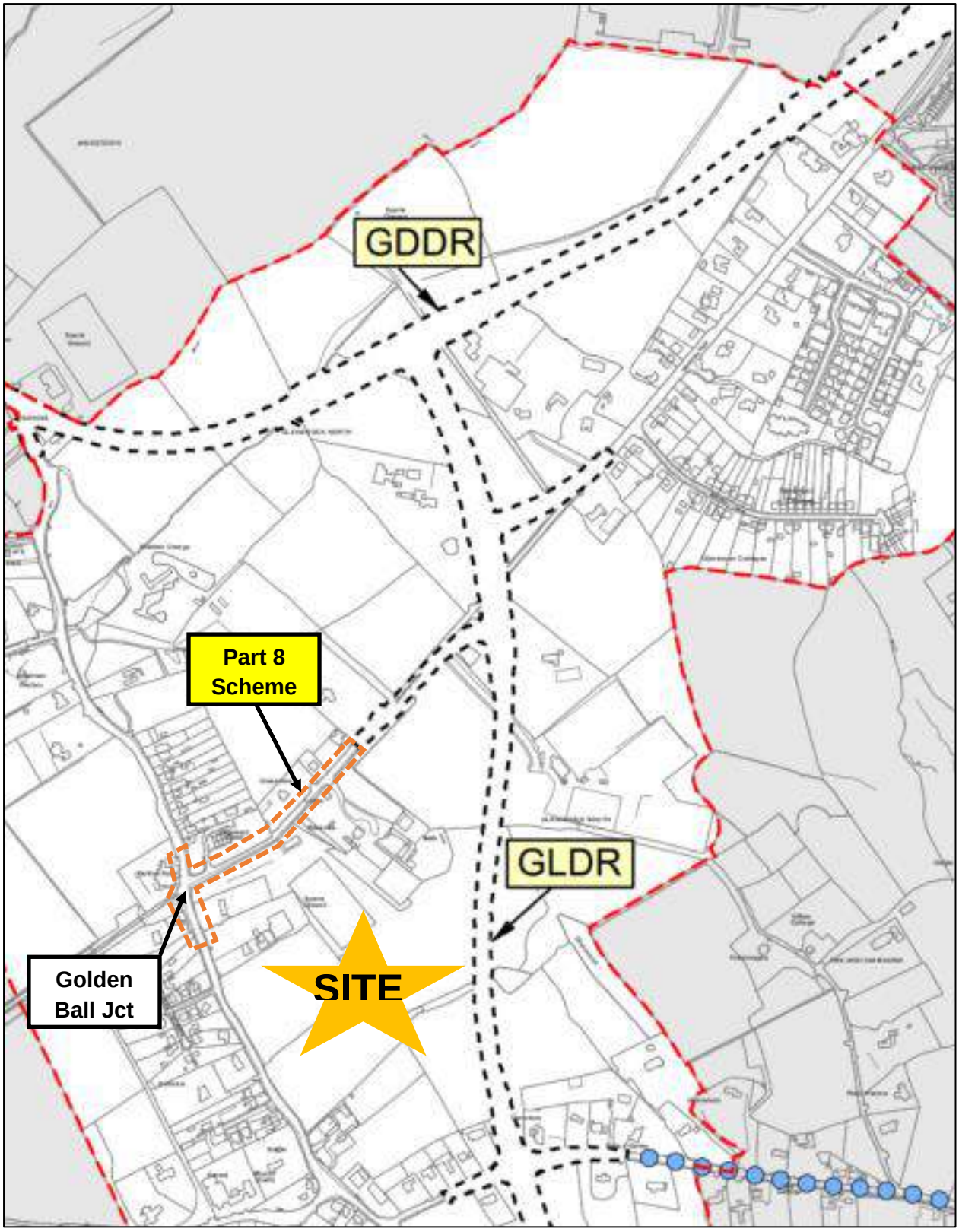

Figure 12-23 GDRS Scheme in the context of the Proposed Development

The completion of the Distributor Roads will result in a significant reduction in traffic along Enniskerry Road and Glenamuck Road. Specific proposals including bus gates on Enniskerry Road and Glenamuck Road will copper fasten this reduction in traffic which will result in these roads become more conducive to pedestrian and cycle movement. In particular the provision of

footpaths and cycle tracks along the full extent of Glenamuck Road as far as the Link Distributor Road and the upgrading of Enniskerry Road as a traffic calmed street, incorporating widened footpaths, to facilitate local pedestrian, cycle, bus and other vehicular movements will result in a significant change in the function and form of these roads and the reduction in volume and speed of traffic travelling on these roads.

In correspondence with Gerry D'Arcy DLRCC Roads and Transportation in February 2022 and as confirmed in May 2022 the following was confirmed:

- DLRCC intends to deliver the GDRS and Part 8 scheme as one scheme under a single tender;
- The scheme(s) have all necessary Statutory Consents;
- The scheme(s) have funding;
- DLRCOCO are anticipating going out to Tender for Construction in Q2 2022;
- DLRCOCO expect to be on site Q3-Q4 2022;
- Programme 18 to 21 Months; and
- Scheme Complete circa Q3 -Q4 2024.

The scheme (consisting of the GDRS and Part 8) would be delivered in one Phase. Based on knowledge of the area and construction impacts DLRCC expects that the first part to be delivered would be the GDDR so that traffic could avoid Kilternan Village and Enniskerry Road and Glenamuck Road and that following that the GLDR would be constructed. However, he noted that this would need to be agreed with the Contractor upon appointment. The above correspondence with DLRCC is located in Appendix G of the Traffic and Transport Assessment submitted separately in support of this planning application.

12.1.3.6.3 Pedestrian and Cycle Network

Sitting within the heart of the LAP lands the site will benefit from the development of the wider walking and cycling network in accordance with the relevant objectives set out in the County Development Plan and the LAP through the delivery of the GDRS as outlined in the previous section that provides a very high level of service to encourage and facilitate walking and cycling.

The site is located on a designated cycle route as set out in the Greater Dublin Area Cycle Network Plan that overlaps and complements the cycle route objectives of the Dún Laoghaire-Rathdown County Development Plan. The site is located proximate to Route D1 on Enniskerry Road and Route D4 on Ballycorus Road. Glenamuck Road is designated as a feeder cycle route as shown in Figure 12-24.

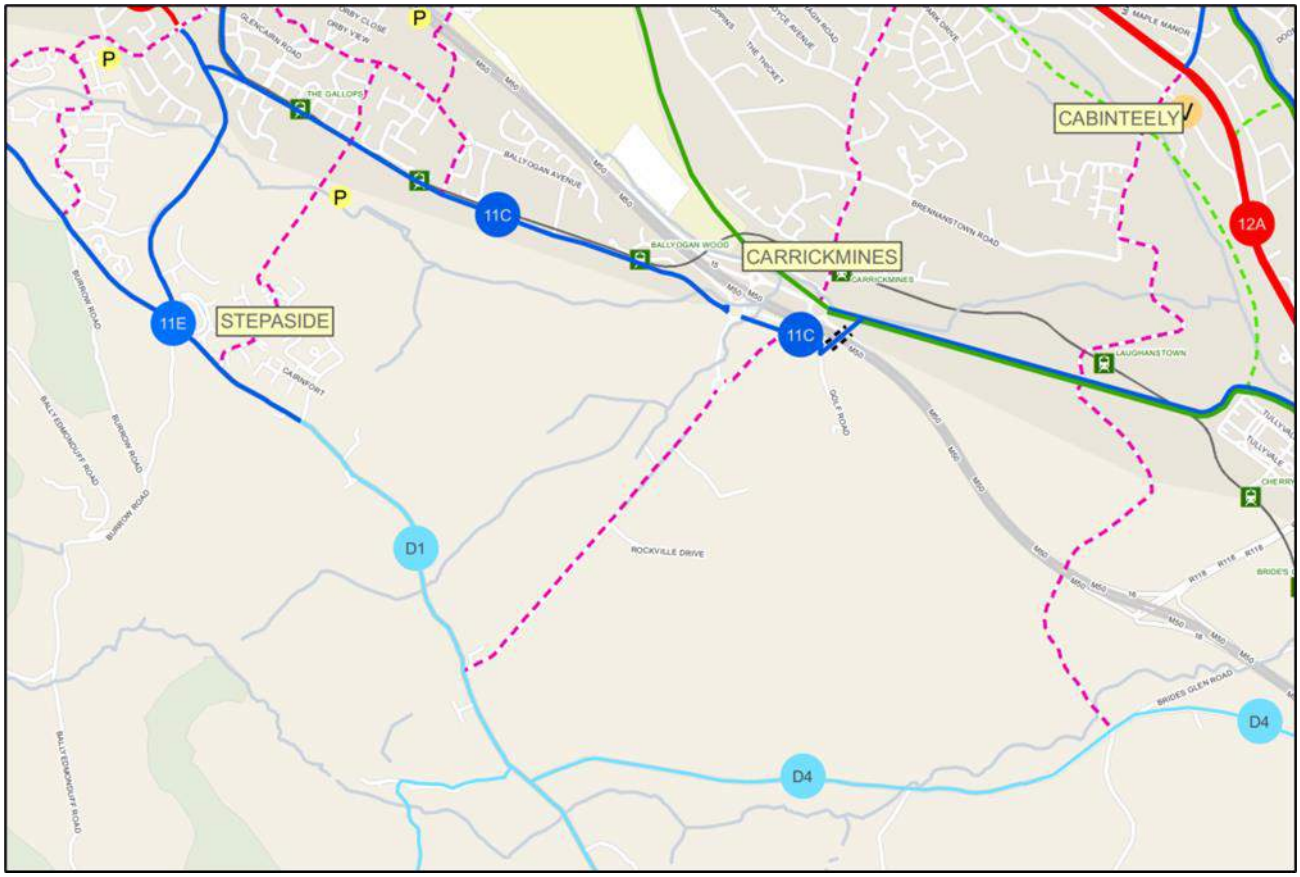

Figure 12-24 Greater Dublin Area Cycle Network

On the completion of the Glenamuck District Roads Scheme (GDRS) the Proposed Development site will be directly connected to these improvements and the wider footpath and cycle track improvements along the distributor roads. In overall terms therefore the site is centrally located within the LAP lands so as to be fully integrated into the comprehensive walking and cycling network that will link the development to local amenities and to the wider amenities, services and public transport provision.

12.1.3.6.4 Public Transport

At a regional level the National Transport Authority (NTA) the 'Transport Strategy for the Greater Dublin Area 2016 – 2035 provides the overall strategy for the sustainable development of the GDA region. This strategy sets out the transport objectives for the region in terms of bus, rail, walking, cycling and roads objectives. The development of the LAP lands to the potential provision of up to 3,000 residential units will result in a local population increase of over 8,000 people.

12.1.3.6.5 Bus Routes

The New Dublin Area Bus network was published by the NTA in September 2020 with implementation of the network commencing in 2021. Under this new network there are a number of proposed routes that pertain to the Proposed Development. They are listed below:

- L13: Kilternan - Ringsend Bus garage
- L26: Kilternan - Blackrock

- P13: Kilternan - UCD
- 88: Enniskerry - Mountjoy Square

The proposed local bus network under the New Dublin Area Bus network is shown in Figure 12-25.

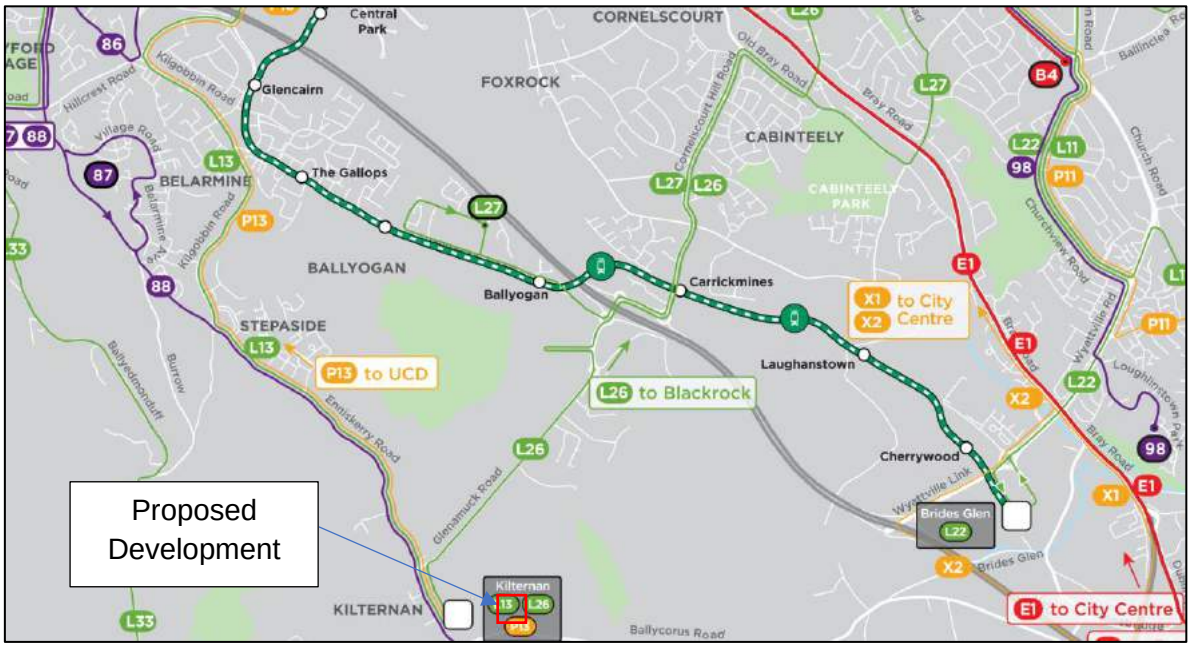

Figure 12-25 Proposed Local Bus Network under the New Greater Dublin Area Bus Network

The nearest core bus corridor to the Proposed Development as proposed under Bus Connects is bus corridor 13, Bray to City Centre. The current preferred route runs along the eastern side of the M50 through Cabinteely and Cornelscourt as shown in Figure 12-26. The proposed L26 bus route links up with the core bus corridor 13.

Figure 12-26 Bus Connects: Core Bus Corridor 13

The scale of growth in the LAP lands will result in a demand for increased bus services and a corresponding substantial increase in the frequency and capacity of bus services serving Kilternan. The Proposed Development site is ideally located within short walking distance to access bus services that operate on Glenamuck Road, serving the Ballyogan Luas stop and Enniskerry Road serving the City Centre and onwards to the north city. It is noted that the Bus Connect Network improvement will be subject to a second phase consultation process later this year. These proposals will include improvements to bus services in Kilternan which will be further improved in terms of frequency as the population grows in line with the planned local population increase to 8,000 people.

In terms of planned bus routes, the previous County Development Plan had set out objectives for Priority Bus Schemes including the following:

- Enniskerry Road - Glenamuck Road South - The Park - Ballyogan Luas Stop. This route runs immediately adjacent the site;
- Cherrywood to Blackrock via Wyattville Dual Carriageway; and
- Cherrywood to Dún Laoghaire via Wyattville Dual Carriageway.

These routes are illustrated in the Figure 12-27, an extract from supplementary map t1 from the previous development plan.

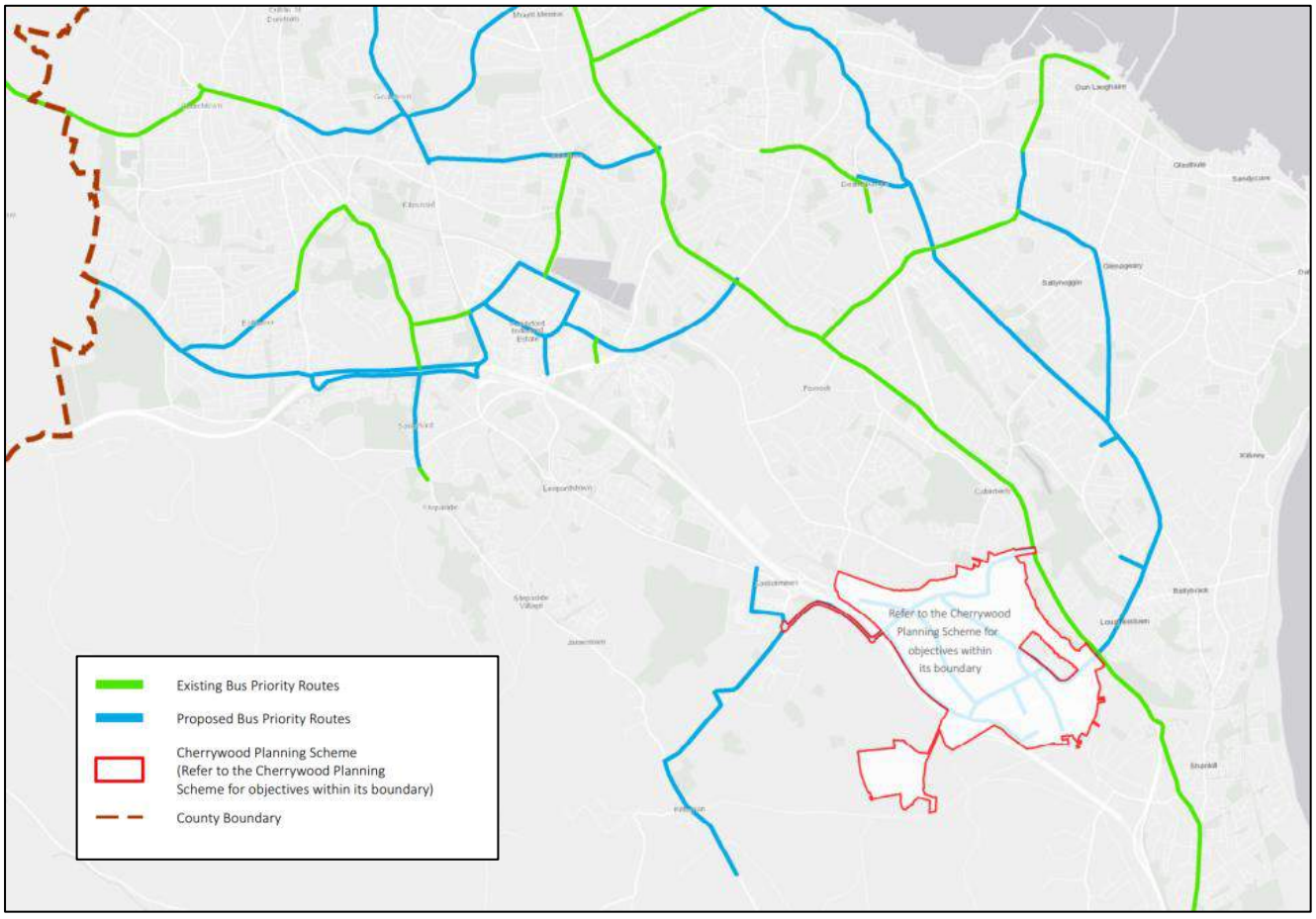

Figure 12-27 Existing and Planned Bus Routes

Some of the measures outlined in the plans for the Enniskerry Road and Glenamuck Road are coincident with the bus priority measures in the GDRS that will be delivered in 2024 when that scheme is finalised.

12.1.3.6.6 LUAS and Metro

The current NTA approach for the upgrading the existing Luas Green Line to MetroLink involves a three-stage proposal as outlined below:

- First stage: This would comprise the development of MetroLink from Swords to Charlemont without connecting to the Green Line but continuing the required tunnel boring works to allow the future connection to the existing Luas line;
- Second stage: Incremental improvements to the Green Line to increase its capacity up to 30 trams per hour (55 metre long); and
- Third stage: the connection made from the MetroLink tunnel termination point onto the Green Line.

12.1.3.6.7 Summary of Future Transport Proposal

As set out in the above section the delivery of the above transport infrastructure in the Kilternan area will radically transform the way people move about by providing significantly enhanced active and sustainable travel opportunities that has the potential to reduce single occupancy car journey with positive implications for mode share and the environment.

12.1.4 Characteristics of the Proposed Development

The development will principally consist of the demolition of 573.2 sq m of existing structures on site comprising derelict farmyard buildings; and the provision of a mixed use development consisting of 383 No. residential units and a Neighbourhood Centre with a gross floor area of 2,512 sq m. Table 12-9 provides a full breakdown of the schedule of accommodation and residential mix.

Table 12-9 Kilternan Masterplan Land Uses

Residential Accommodation	No. of Units	Unit Mix	No. of Units
Houses	165	3 Bed	108
		4 Bed	57
Duplexes	118	1 Bed	8
		2 Bed	50
		3 Bed	60
Apartments	100	1 Bed	19
		2 Bed	78
		3 Bed	3
Residential Total	383		
Neighbourhood Centre	GFA - sqm		
Creche	439		
Office	317		
Medical	147		
Retail	857		
Retail (convenience)	431		
Community	321		
Neighbourhood centre	2512 sqm		

The proposed development also provides vehicular access from Enniskerry Road and Glenamuck Road; vehicular access to the future Glenamuck Link Distributor Road; pedestrian links from Enniskerry Road and within the site to the neighbouring “Rockville” development to the north-east and a pedestrian/cycle route through the Dingle Way from Enniskerry Road to the future Glenamuck Link Distributor Road; 678 No. car parking spaces; bicycle parking; bin storage; boundary treatments; private balconies, terraces and gardens; hard and soft landscaping; plant; and all other associated site works above and below ground.

The development provides car parking spaces and bicycle parking, bin storage; boundary treatments; private balconies, terraces and gardens; hard and soft landscaping; plant; and all other associated site works above and below ground.

The proposal is for a mixed-use development that includes residential, retail, commercial and community facilities. The mixed-use nature of the development and the design of the masterplan in accordance with Design Manual for Roads and Streets (DMURS) principles will help to encourage active travel and reduce the need to drive in accordance with the “15 Minute City Principles. Further details of the Proposed Development are outline in the sections below and the layout plan is illustrated in Figure 12-28.

Figure 12-28 Masterplan of Proposed Development

12.1.4.1 Phasing

The proposed mixed use development will be delivered over five phases as outlined in Table 12-10.

Table 12-10 Proposed Phasing Strategy

Phase	**Residential Units**	**Neighbourhood Centre**	**Duration Months**	**Start**	**End**
Phase 1	91		18	Apr- 23	Sep -24
Phase 2 & 2a	126	2191	24	Apr -24	Mar -26
Phase 3	59		12	Aug -25	Jul-26
Phase 4	97		26	Feb-26	Apr-28
Phase 5	10	321	8	Sep 27	Apr -28
Total	383	2512			

Works associated with each phase are shown in Table 12-11.

Table 12-11 Associated works with Phasing Plan

Phase	Units	Associated Works
Phase 1	91	Main Public Open Space.
		Central Tree Line.
		Off Site Drainage through Southern Lands.
		Main drainage for scheme.
		Works to Enniskerry Road.
		Main Spin Road to GLDR (make connection in this phase if GLDR Operational otherwise connection made in Phase 2).
Phase 2	73	Associated site development works
		Connection to GLDR if not completed in Phase 1.
Phase 2a	53	Neighbourhood Centre & Associated site development works.
Phase 3	59	Associated site development works
		Public Open Space .
Phase 4	97	Associated site development works
		Public Open Space (under power lines).
Phase 5	10	Associated site development works.

The outline phasing plan is shown on Figure 12-29. As outlined in Table 12-11 the delivery of Phase 1 of the Proposed Development in Q3 2024 is due to coincide with the delivery of the GDRS including the Part 8 scheme in Q3 of 2024.

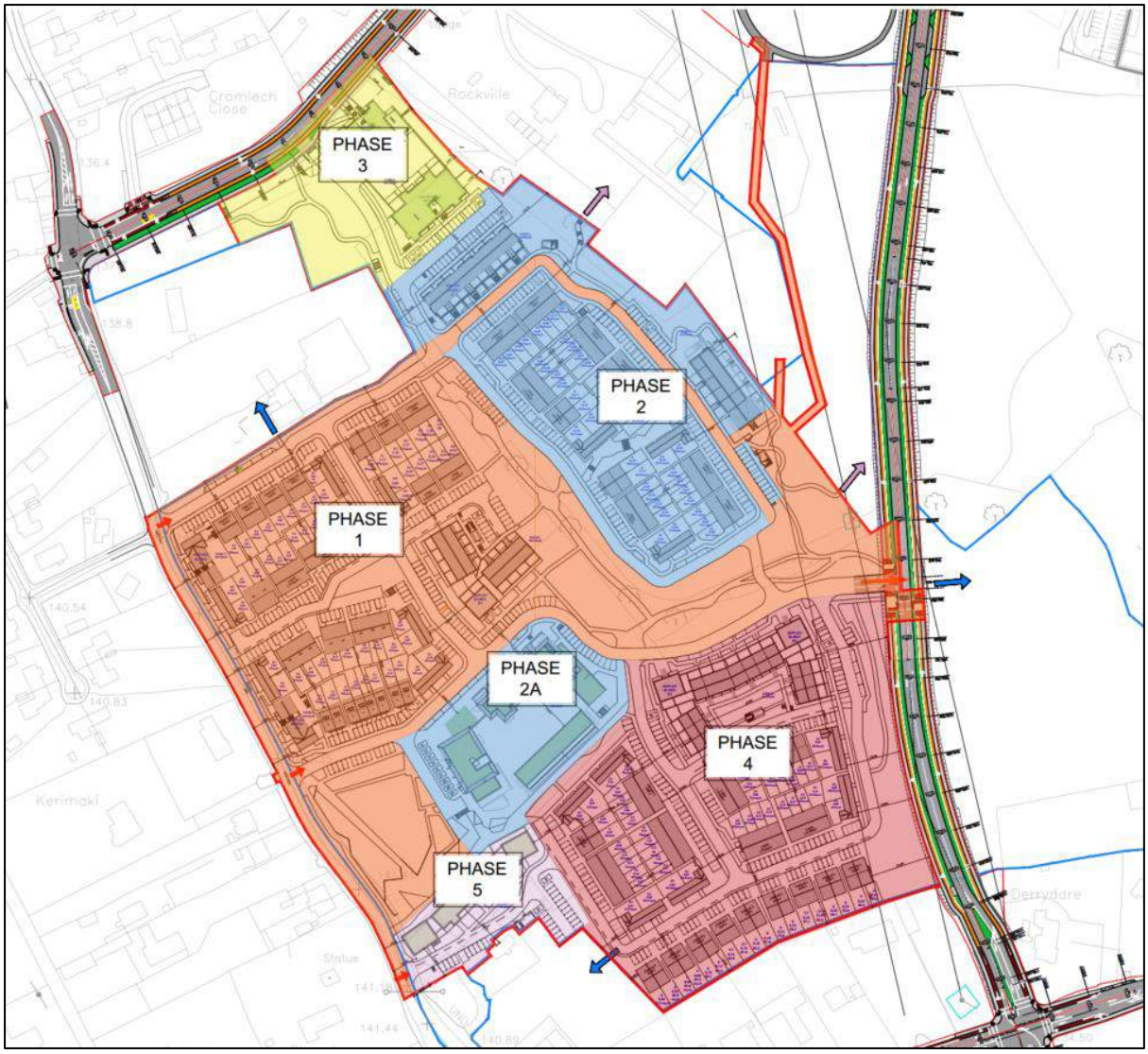

Figure 12-29 Outline Phasing Strategy

12.1.4.2 Site Access, Circulation and Layout

The masterplanning of the lands has been developed in a collaborative and iterative process amongst the design team to ensure that the layout was designed to follow the road hierarchy with pedestrian at the top and vehicles at the bottom. The internal layout looks to maximise permeability and opportunities for walking and cycling. External access points including some pedestrian cycle only access points are located along predicted desire lines to facilitate easy access to local services and amenities.

The layout follows DMURS principles as set out in the following section.

12.1.4.2.1 DMURS

DMURS is the appropriate design guidance to be applied to urban environments such as cities, towns villages and urban developments such as residential estates.

"*The principles, approaches and standards set out in the Manual apply to the design of all urban roads and streets (that is streets and roads with a speed limit of 60km/h or less)...*"

DMURS requires a collaborative design process and a holistic design approach to the layout and design of urban streets; to this end the design team consisting of planners, architects, engineers and the client have engaged in a consultative process to ensure that the Proposed Development incorporates the design principles espoused in DMURS.

The street layouts have been developed to deliver a high place function wherein the streets and open spaces form part of the social fabric and are used for congregation and play. Achievement of this function can be greatly facilitated by developing a self-regulating street environment wherein vehicular movement function should be limited, as much as is practicable and a desirable maximum design speed of 20kph being achieved.

The street layout accommodates high levels of permeability for pedestrians and cyclists along streets and through open spaces, and onto Enniskerry Road and Glenamuck Road. Vehicular permeability has been predominantly limited to local access only, predominantly for residents with appropriate access provision for emergency and service vehicles.

All streets have been designed in the context of achieving a shared street provision in the street carriageway, per the National Cycle Manual, wherein the road space is shared between cyclists and vehicles. The side of the street remains the preserve of the pedestrian on the footway. Paramount to achieving this outcome is significantly limiting vehicle volumes and achieving, by design, a self-regulating desirable maximum speed of 20kph.

The design of the streetscape including the provision of car parking will significantly influence the achievement of lower traffic speeds and the required quality of street design.

12.1.4.2.2 Compliance with DMURS

A 30km/h slow zone, as required on residential streets that have no strategic or distributor function, will be promoted via the combination of the design elements below:

- Horizontal and vertical alignment to achieve a 30km/h design speed;
- Carriageway widths in line with DMURS requirement for street type;
- Constrained junction radii in line with DMURS requirement;
- Raised table entry treatments at access junctions; and
- Provision of raised tables at internal Junctions.

Landscaping has been proposed so as not to create ‘blind spots’ and ensure that inter-visibility is maintained between pedestrians, cyclists and motorists.

12.1.4.2.3 Internal Road Street Layout

Best practice in relation to the design was referenced from the following current design documents and guidelines:

- Design Manual for Urban Roads and Streets (DMURS),

- The National Cycle Manual (NCM); and
- National Transport Authority: Permeability Best Practise Guide.

The site layout has been developed in accordance with the principles of DMURS taking note of the site constraints associated with the level changes across the site. In the context of these constraints and the required open space provision, the site layout for the development has been developed as a local street between the Glenamuck Road and Enniskerry Road and home zone streets off the local street to provide access within the development.

The internal street layout is based on the internal link street linking the three site junctions but designed to preclude rat running through the site. This street is a specific objective of the LAP with junctions located onto the Enniskerry Road and provision of a junction to the GLDR.

The street layout for the development essentially consists of two types of street typology, as outlined below:

- Local Street; and
- Home Zone Street.

The street hierarchy and typology are shown in Figure 12-30. Further details are shown on Atkins drawing (Ref 5158632/HTR/DR/02/0100).

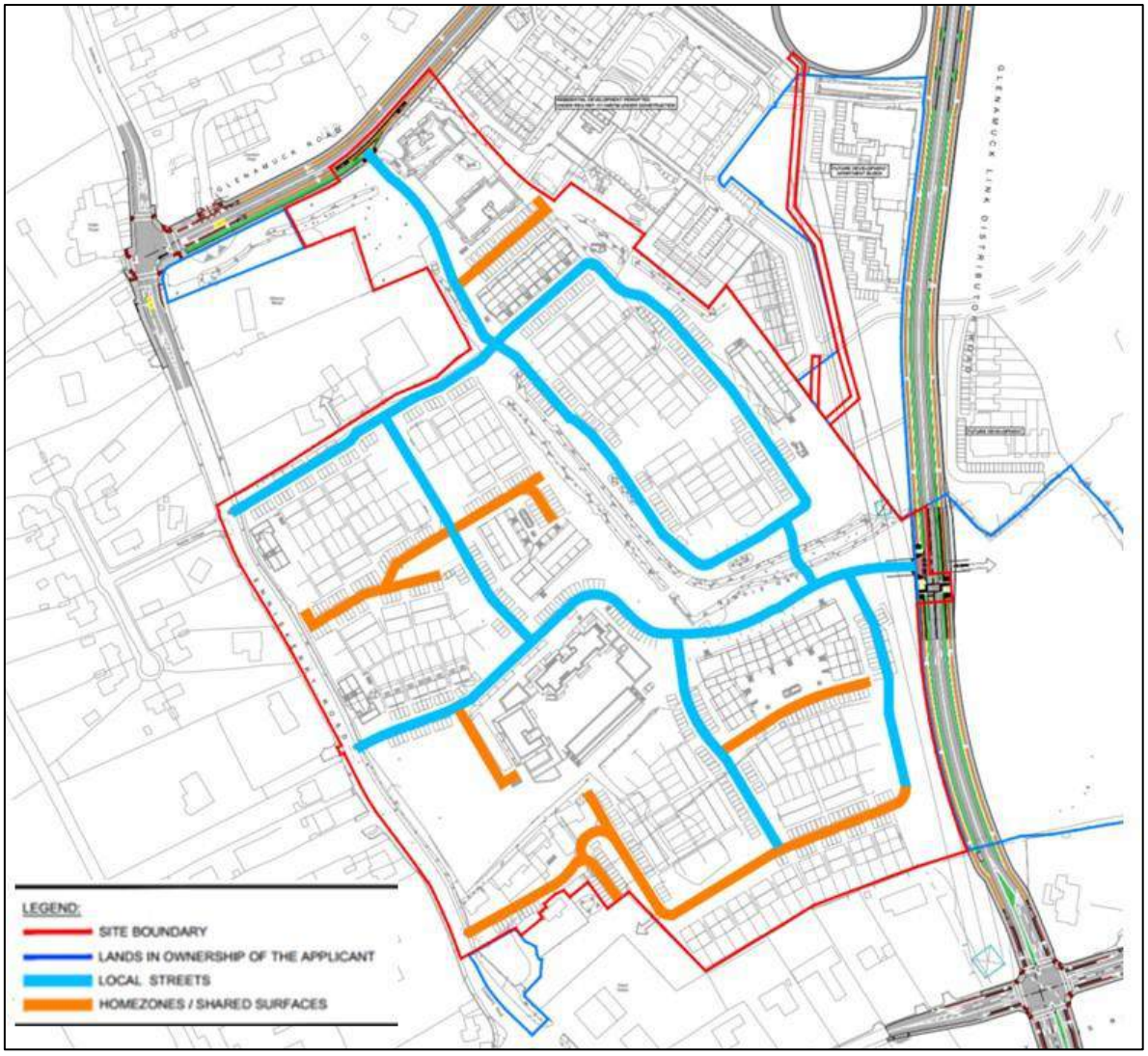

Figure 12-30 Street Typology

In the context of this particular site this is the street layout that optimises permeability whilst responding to the prevailing topography and the critical elements of open space provision and retention of trees. Vehicular permeability is provided through the local street with appropriate provision for vehicular access to the adjacent masterplan lands. The streets are all designed to facilitate pedestrian and cyclist permeability to the adjacent lands and onto the Enniskerry Road and pedestrian and cyclist facilities of the GDRS.

12.1.4.2.4 Street Typology

The design criteria for the street types are detailed in Table 12-12.

Table 12-12 Design Criteria

Design Criteria	Local Street	Home Zone Street
DMURS Recommended Design Speed	10-30km/h	10-30km/h
Adopted Design Speed	30km/h	30km/h
Minimum Horizontal Radius	11m	11m
Maximum Gradient	5%	5%

Minimum Gradient	0.5%	0.5%
Carriageway Width	5.5m-6.0m	4.8m
Footway Width	2.0m	1.2m
Junction Radii	6m between Local Street and Enniskerry Road 3.0m-4.5m between Local Street and Local Street	3m between Home Zone Streets and Local Street
Junction Approach Gradient	2%	2%

The Home Zones are designed as shared space streets, albeit with separate 1.2M wide footway provision, wherein the shared space will become central to the social fabric of the area as an informal space wherein children can play and the community can congregate, directly adjacent to their residence. This shared space provision will be fundamentally established in the context of very low volumes of traffic movements taking place at very low self-regulating traffic speeds.

Typical cross sections outlining the above design principles is shown in Figure 12-31. Further cross sections throughout the development are shown on Atkins drawings 5158632/HTR/DR/0115 to 0120. A full set of Atkins Roads / Traffic / Transport drawings are submitted separately in support of this SHD planning application.

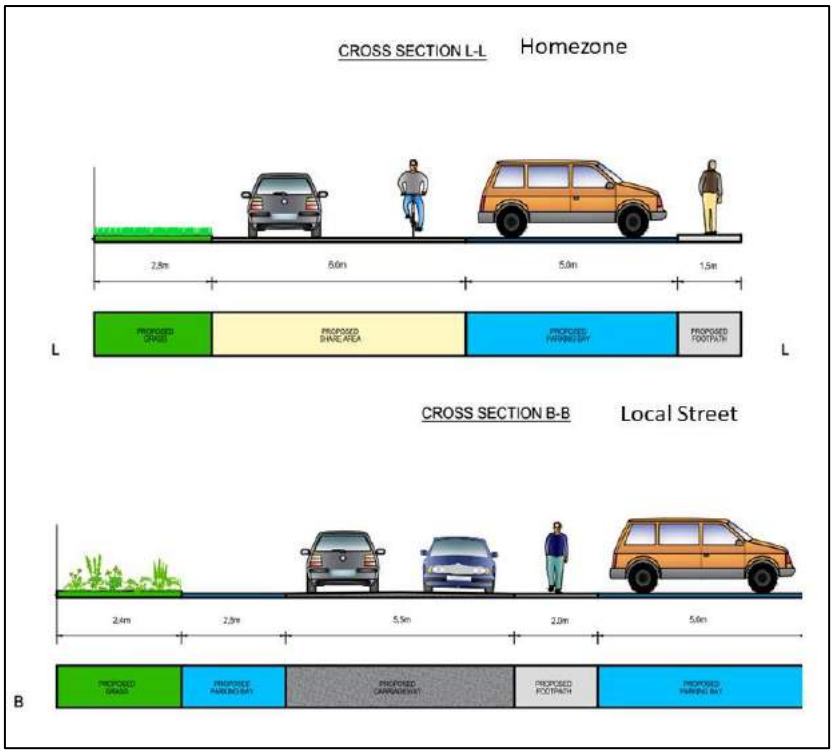

Figure 12-31 Typical Cross Sections for Masterplan Streets

The design vehicle for service and delivery access is a refuse vehicle. Delivery vehicles are facilitated to turn and reverse a short distance along the Home Zone streets to facilitate the collection of refuse. This is common practise along cul de sacs and precludes the overbearing requirement of providing large turning areas at the end of cul de sacs to serve a vehicular movement that occurs once a week. Furthermore, these large turning areas are invariably used as car parking areas that preclude the turning of larger vehicles.

12.1.4.2.5 Junction Design

The design of the junctions is based on the proposed cross section at these locations and vehicle swept path analysis has been utilised to determine if any of the junctions require amendment to incorporate the largest expected vehicle manoeuvres, a refuse vehicle, through the junction. In general, tight corner radii are proposed in order to reduce traffic speeds which, in turn, create a safer urban environment for pedestrians and cyclists.

Junction arrangements for the Proposed Development are shown on Atkins drawings 5158632/HTR/DR/0104 to 0107. Visibility Splays at the junctions are shown on Atkins Drawings 5158632/HTR/DR/0108 to 0111. A full set of Atkins Roads / Traffic / Transport drawings are submitted separately in support of this SHD planning application.

12.1.4.2.6 Internal Junctions

Internal junctions between Local Streets are designed in accordance with DMURS generally with 4.5m junction radii. Sight lines are to provide a visibility splay of 14m commensurate with a design speed of 20km/h at a setback of 2.0m.

Internal junctions between Home Zone Streets and Local Street are designed in accordance with DMURS generally with 4.5m junction radii. Sight lines are to provide a visibility splay of 23m commensurate with a design speed of 30km/h at a setback of 2.0m. An example of an internal junction treatment is shown in Figure 12-32.

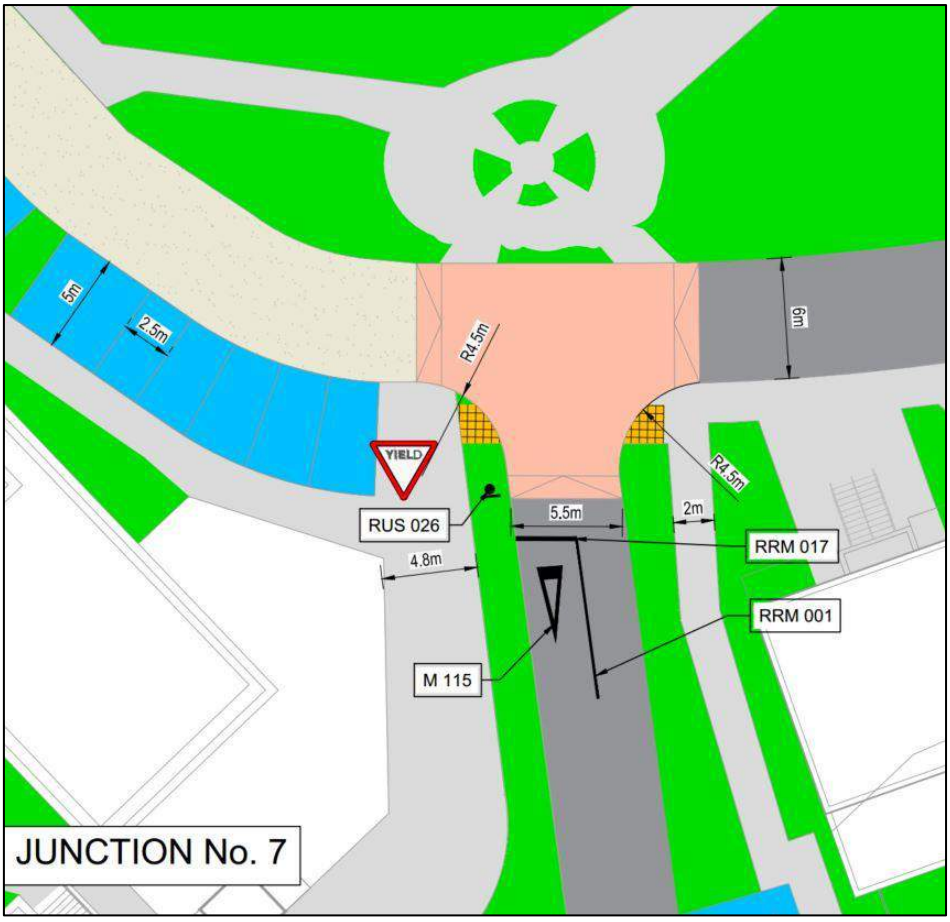

Figure 12-32 Internal Junction Geometry and Layout

12.1.4.2.7 External Access Junctions

The geometry of the site access junctions is designed in accordance with DMURS. In general, these junctions incorporate 6.0m junction radii. Sight lines accommodate a visibility splay of 65m commensurate with a design speed of 50km/h at a setback of 2.0m. The three junctions onto the Enniskerry road will incorporate raised platforms to promote low traffic speeds. An example of an internal junction treatment is shown in Figure 12-34.

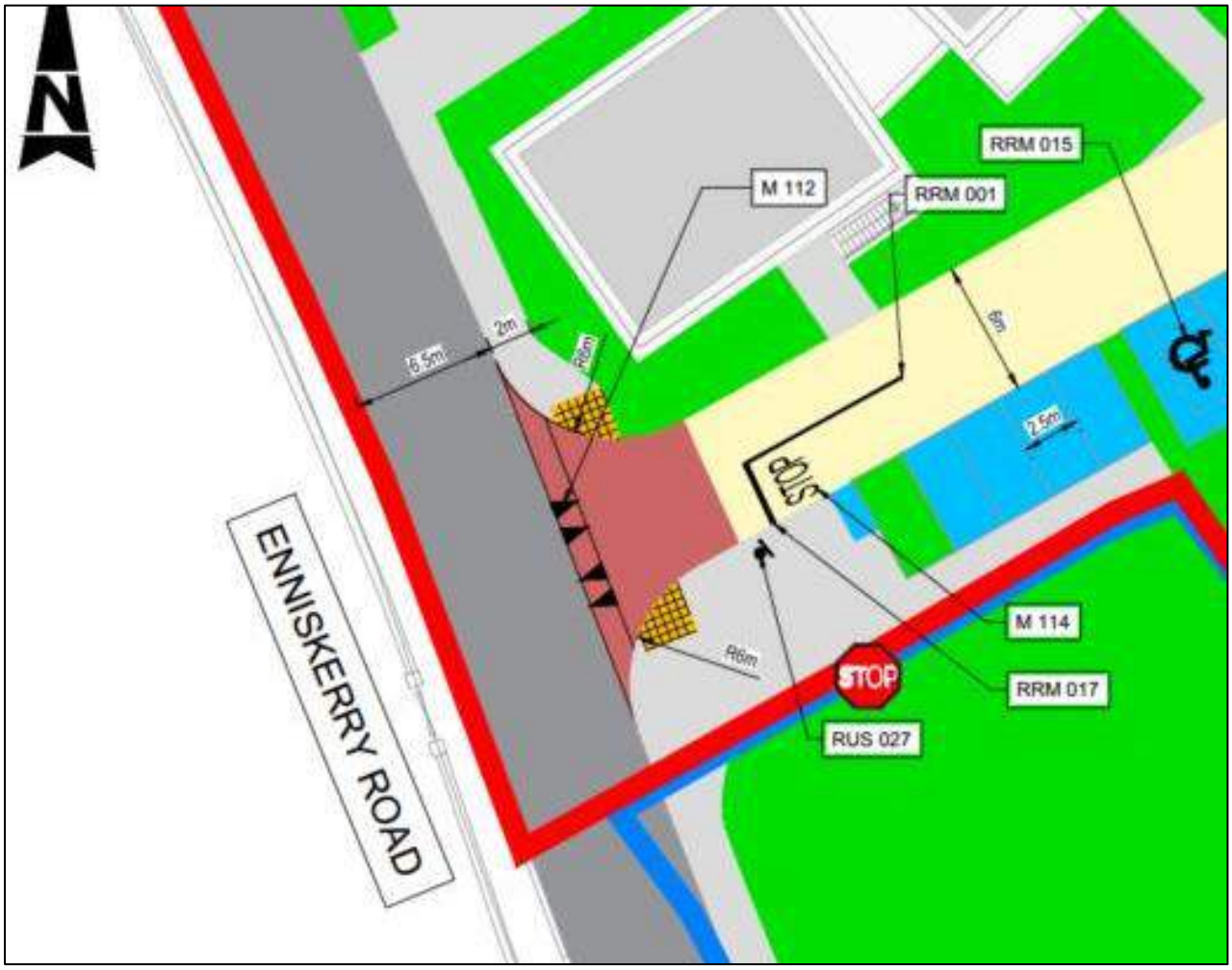

Figure 12-33 External Raised Entry Junction Treatment

12.1.4.3 Facilities for Pedestrians and Cyclists

The provision of high quality pedestrian and cyclist facilities within the development is central to the design principles adopted in relation to the development proposals. Cycle facilities will be on street facilities in line with the principles set out in the National Cycle Manual and reinforced within DMURS. The design of the streets to a self-regulating 30kmh speed limit is central to the safe provision of the shared street cycle regime.

In addition, pedestrian linkages through and around the Proposed Development have been considered in the context of desire lines and onwards towards existing and proposed amenities. The masterplan layout has been developed to accommodate these desire lines and linkages.

Drop kerb crossings will be provided at the majority of junctions throughout the site with raised table pedestrian crossings provided in certain locations. The use of raised pedestrian table crossing points will have the benefit of providing both a convenient crossing point and a traffic calming effect. The raised table pedestrian crossing design is based on the recommendations in DMURS and the Traffic Management Guidelines. Raised pedestrian crossing will also be provided along the footpaths at the site junctions on Glenamuck Road and Enniskerry Road. Internal raised entrance details are shown in Figure 12-34.

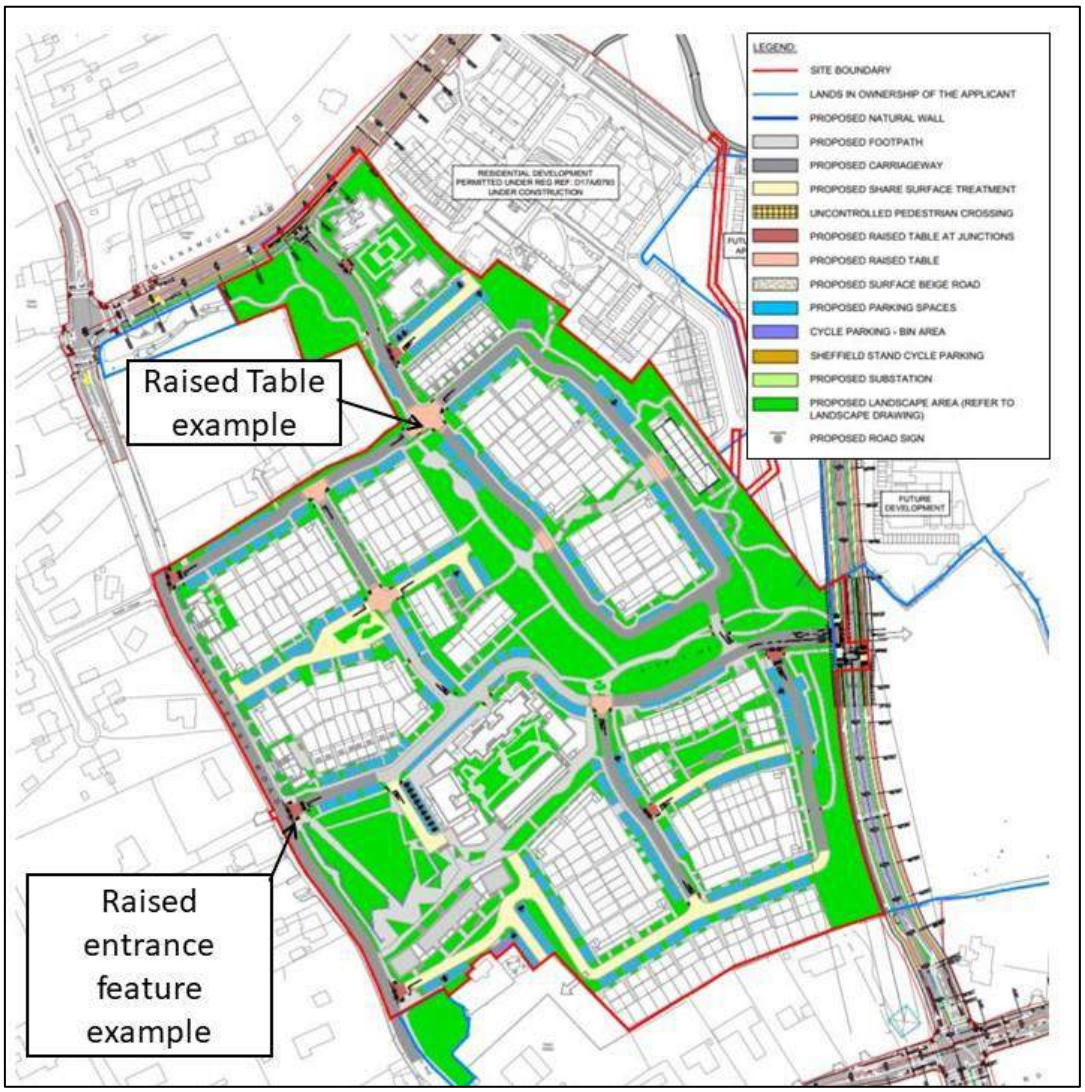

Figure 12-34 Location of internal raised tables and traffic calming

12.1.4.3.1 Walking and Cycling facilities

The pedestrian network provide is legible, direct, safe and overlooked and meets expected desire lines in order to promote walking. On local street footpaths are provided, while in homezone's walking is shared on street in low traffic, low speed environments. In addition to the above there is a network of off road greenways through the site including the Dingle Way that provides comfortable leisurely walking opportunities. Figure 12-35 shows the network of walking facilities provided within the masterplan lands. Where routes meet roads, raised treatment and or tables provide pedestrian priority across these junctions.

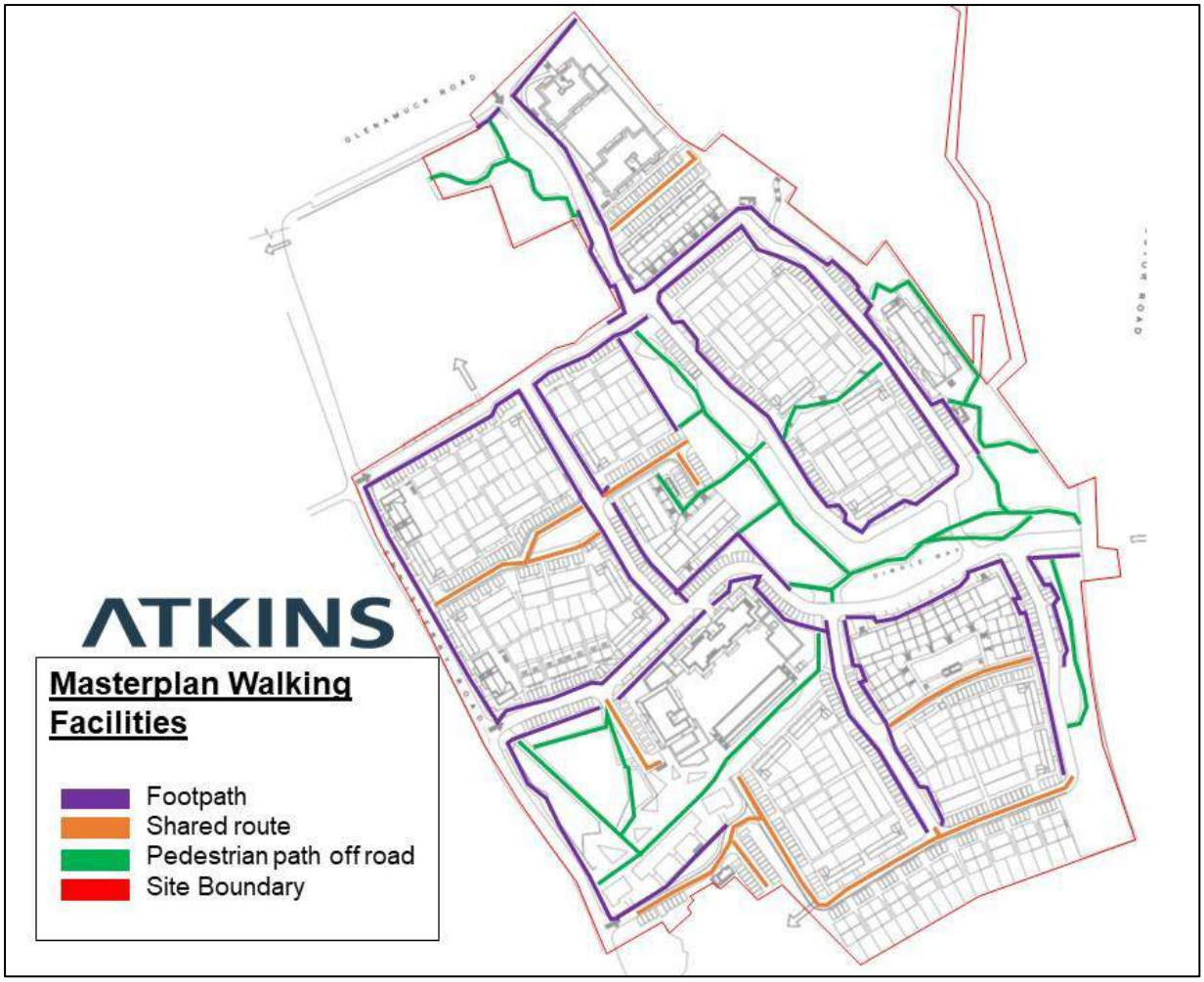

Figure 12-35 Masterplan Walking Facilities

As the road network is designed for low traffic volumes and speeds in accordance with DMURS principles cycle provision is provided on street. This accords with the recommendations in the National Cycle Manual. Cycle facilities within the masterplan are shown in Figure 12-36.

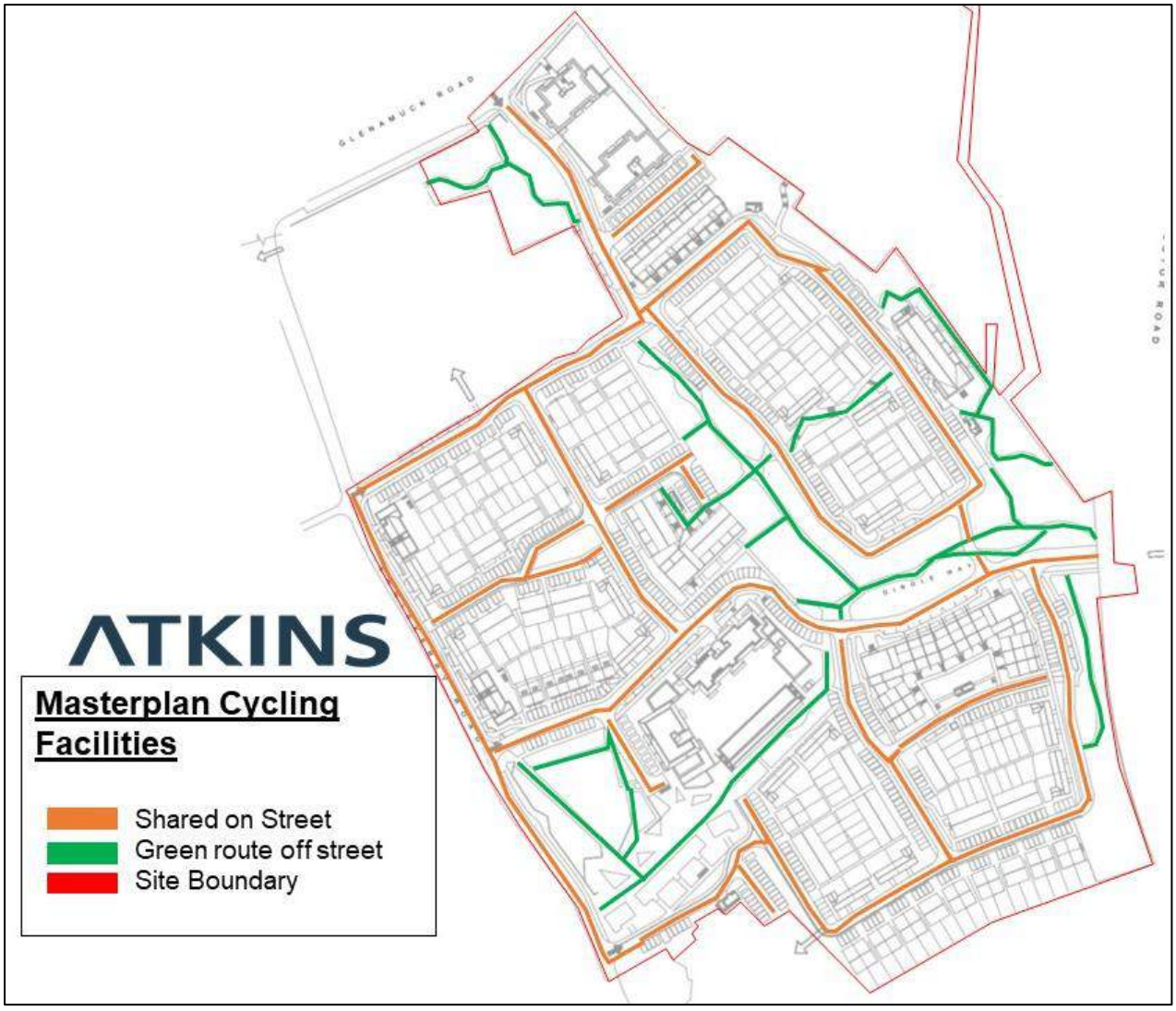

Figure 12-36 Masterplan Cycling Facilities

12.1.4.4 External Connections

As outlined in DMURS, NTA's Permeability Best Practice Guidance and DLR Development Pan and the Kilternan LAP, the Proposed Development has been designed to maximise external walking and cycling linkages to adjoining developments such as Rockville, as well as to local facilities and amenities including the new park at the junction of the GLDR and Glenamuck Road . RMDA Landscape Rationale (Ref 1609-Rev-1 _Kilternan- Landscape Rationale)) shows these linkages in detail. Figure 12-37 is an extract that shows the wider connections. Sitting in the heart of the LAP and with the provision of neighbourhood facilities the development maximises opportunities for wider connections, reducing walking distances and providing improved access to facilities and amenities.

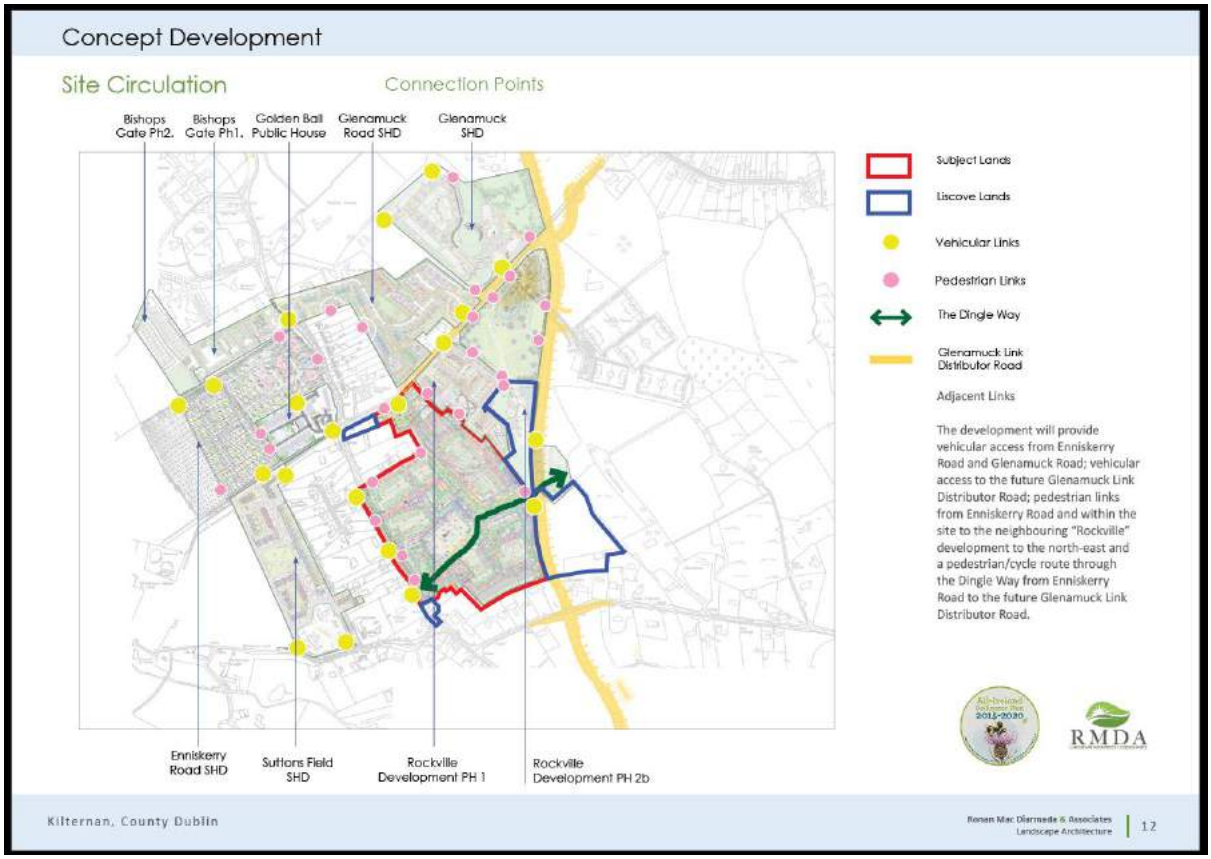

Figure 12-37 Wider Connections

12.1.4.5 Enniskerry Road Treatment

As noted in the LAP the delivery of the GDRS will result in significantly reduced traffic flows on the road network in the area.

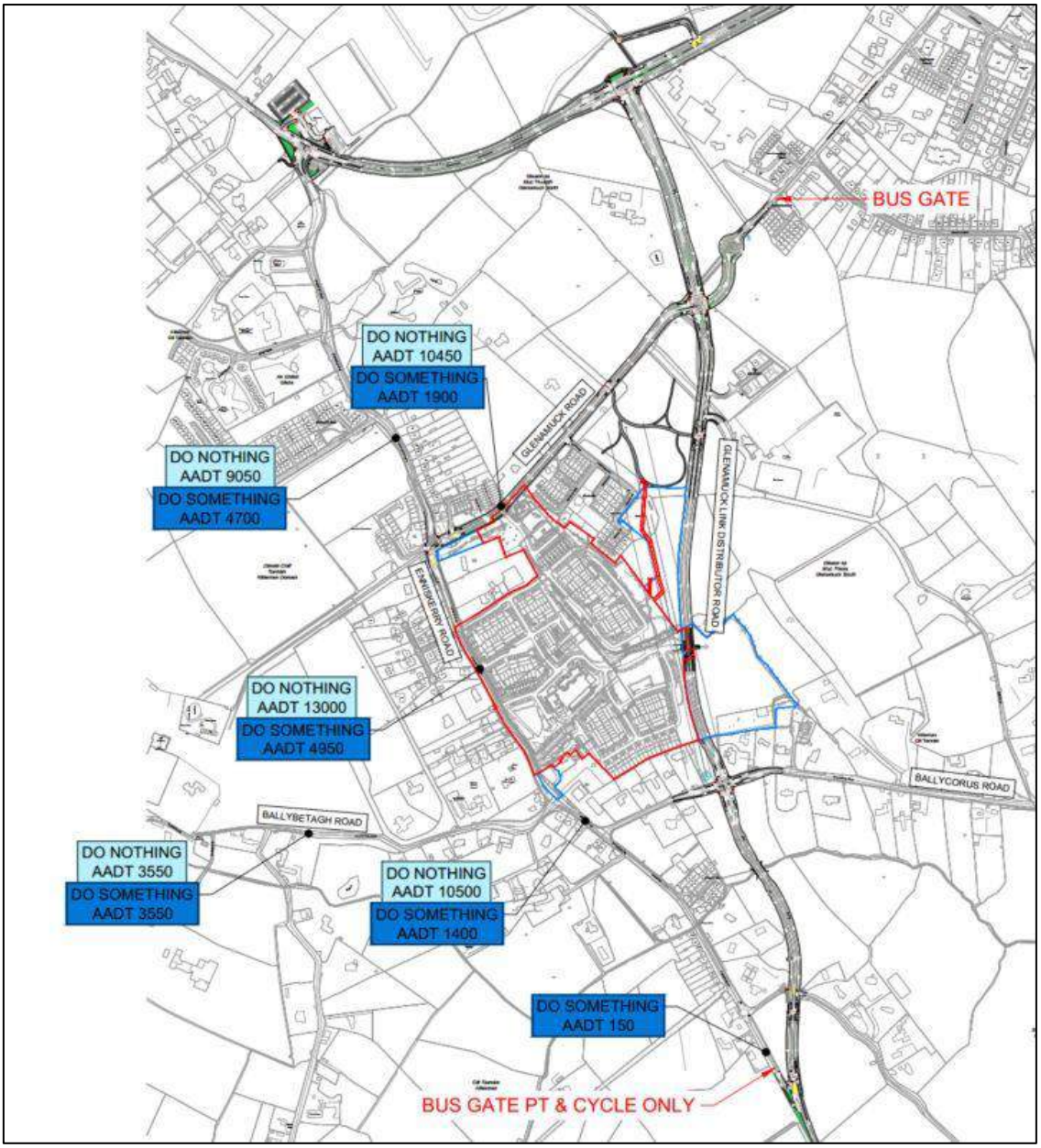

Figure 12-38 AADT Traffic data on local road network before & after the GDRS

Specifically in relation to the Enniskerry Road fronting the site Average Annual Daily Traffic (AADT) will reduced from circa 12,100 PCU to circa 4950 PCU a 61.9% reduction in traffic flows as shown in Table 12-13 and outlined in Figure 12-39.

Table 12-13 Pre and Post AADT on Enniskerry Road

Road	Base AADT	Post GDRS AADT	Reduction
Enniskerry Road	12,100	4950	61.9%

Figure 12-39 Location of AADT data

This reduction in traffic flow will facilitate a revised treatment along Enniskerry Road fronting the site.

Existing Condition on Enniskerry Road fronting the development is:

- Typically, the carriageway is 8.5 metre wide with one lane in each direction;
- Footpath on development side (eastern) varies from circa 1.8 to 2m; and
- On the western side of Enniskerry Rd the footpath width is varies from 1.2 to 2m.

The proposal is to narrow the carriageway down to 6.5m, i.e., a 3.25m running lane in each direction allowing for continued use by bus services. The remaining former carriageway (i.e., 2m) would be reallocated for other road user with the introduction of a widen pedestrian and landscaped feature on the eastern side of the road adjoining and complimenting the proposed landscape and pedestrian environment within the development. Given the reduction in traffic flow the proposal is to cater for cyclist on the carriageway. This approach accords with National Cycle Manual design for lower traffic roads.

The outline design approach is shown in Figure 12-40. Further details are provided on the Landscape Architectures RMDA drawings (ref 1609-Rev-I- Kilternan_ Enniskerry Road Sections).

Figure 12-40 Proposed Enniskerry Road Treatment – extract RMDA drawings

12.1.4.6 Proposed Development Access Junctions

As recommended in DMURS there are number of multi-modal access points to and from the development onto the surrounding road network. This ensures that traffic is spread onto the network minimising adverse impact such as congestion. A total of five vehicle access points is proposed as set out in Table 12-14.

Table 12-14 Access Junction Type

Junction No	Roads	Junction Type	Road Configuration
A1	GLDR and internal Local Street	Priority	1 lane out with right turning flare 1 lane in
A2	Enniskerry Rd / Internal Local Street (north)	Priority	1 lane out 1 lane in
A3	Enniskerry Rd / Internal Local Street (central)	Priority	1 lane out 1 lane in
A4	Enniskerry Rd / Internal Local Street (south)	Priority	1 lane out 1 lane in
A5	Glenamuck Rd / Internal Local Street	Priority	1 lane out 1 lane in

The location of these access points is shown in Figure 12-41.

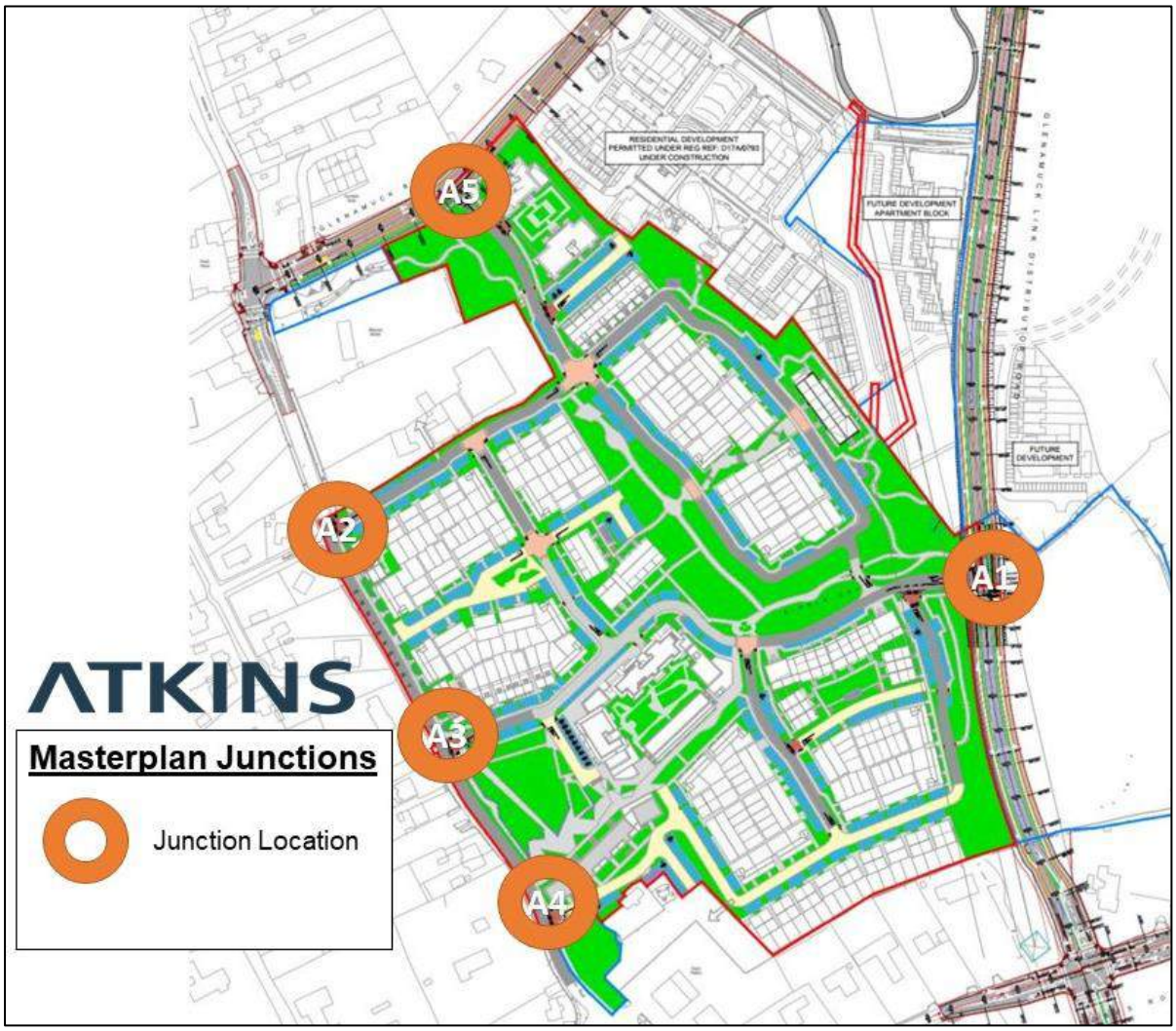

Figure 12-41 Masterplan Junction locations

Visibility from the five external junctions onto the road network complies with DMURS standards with a visibility splay of 49m commensurate with a design speed of 50km/h at a setback of 2.4m.The visibility splays are shown in Atkins Drawing 5158632/01/HTR/DR/0109, an extract of which is shown in Figure 12-42. A full set of Atkins Roads / Traffic / Transport drawings are submitted separately in support of this SHD planning application.

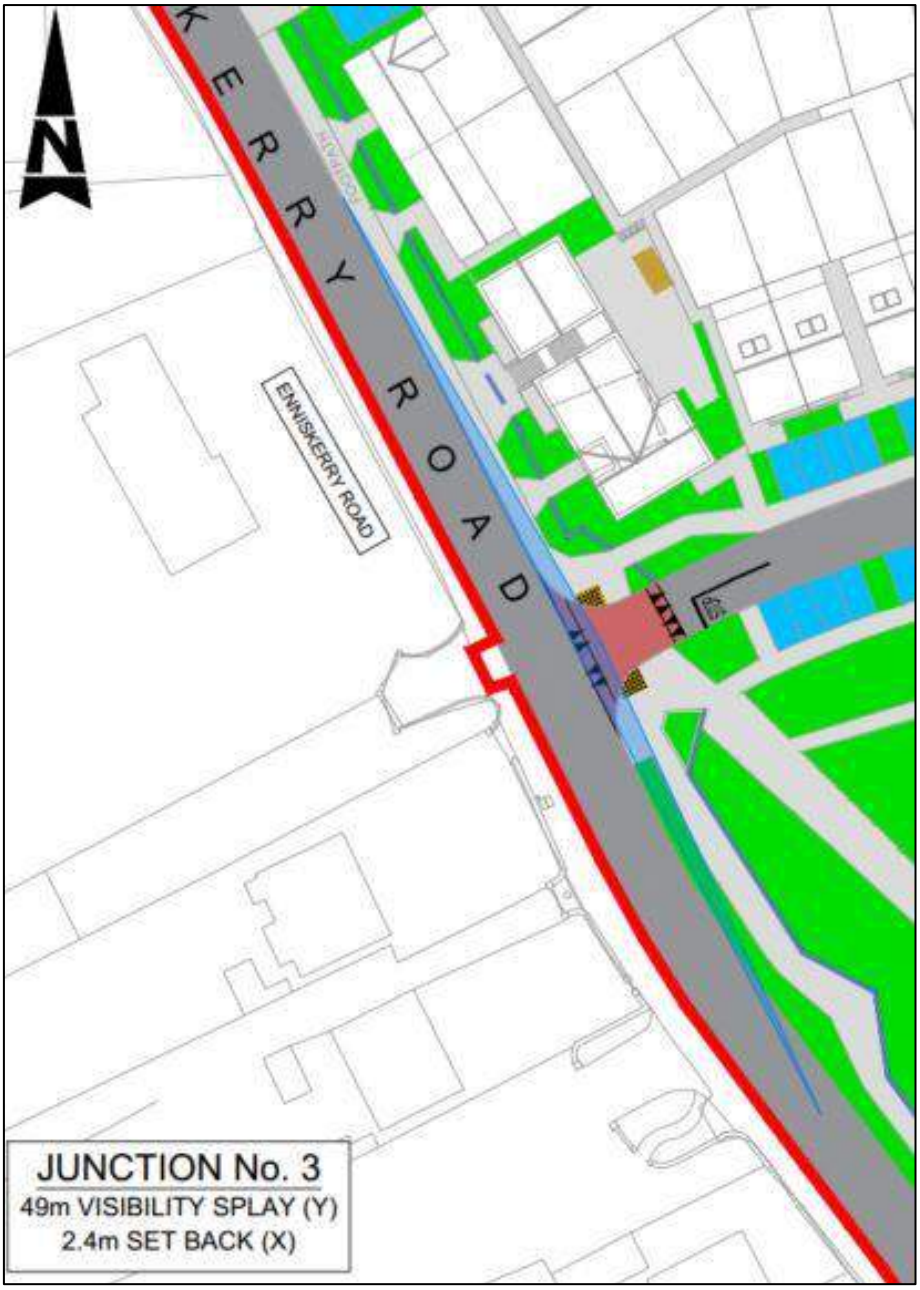

Figure 12-42 Visibility Splays at the five external vehicle access points

12.1.4.7 Servicing and Emergency Vehicle Access

As set out in DMURS and Manual for Streets it is important that the design of roads and junctions is not overly engineered for the occasional use by larger vehicles such as refuse and emergency vehicles as this leads to wider junctions and roads that in turn leads to higher traffic speeds that adversely impacts on safety for all road users and discourages walking and cycling.

The layout accommodates refuse and emergency access through the design of a network of looped local streets and looped home zone streets that remove the need for the vehicle to reverse on these streets thus mitigating potential conflicts with pedestrians and cyclists.

Refuse Vehicle circulation is shown on Atkins drawing 5158632/01/HTR/DR/0112 to 113 , while Fire appliance circulation is shown on Atkins drawings 5158632/01/HTR/DR/0124 to 125. A full

set of Atkins Roads / Traffic / Transport drawings are submitted separately in support of this SHD planning application

An extract from this drawing is shown in Figure 12-43.

Figure 12-43 Refuse Vehicle Track through the development

12.1.4.7.1 Neighbourhood Centre & Other Servicing

Specific loading and unloading facilities have been provided for the commercial uses associated with the neighbourhood centre uses that will minimise conflict with other roads users, particularly vulnerable road users. The location of the neighbourhood centre loading facilities is shown on drawings. The location of the Neighbourhood Centre Loading bay is shown on Figure 12-44.

It is anticipated that the loading bay could be dual purpose, functioning as a loading bay a specific time during the day to coincide with peak deliveries and at other times could be used for visitor parking. Traffic Regulation Orders would be in place to donate times when loading only was allowed.

Figure 12-44 Neighbourhood Centre Loading Bay

As noted earlier both DMURS and Manual for Streets state that it is important that the design of roads and junctions is not overly engineered for the occasional use by larger vehicles such as refuse and emergency vehicles as this leads to wider junctions and roads that in turn leads to higher traffic speeds that adversely impacts on safety for all road users and discourages walking and cycling. In general, the proposed layout is conducive to allow for occasional deliveries associated with smaller van type vehicles to occur from the road frontage that would not adversely impact on the operation or road safety. In order to accommodate deliveries for the apartments and Phase 5 uses dedicated loading bays that can accommodate smaller servicing vehicles have been provided as detail in Figure 12-45.

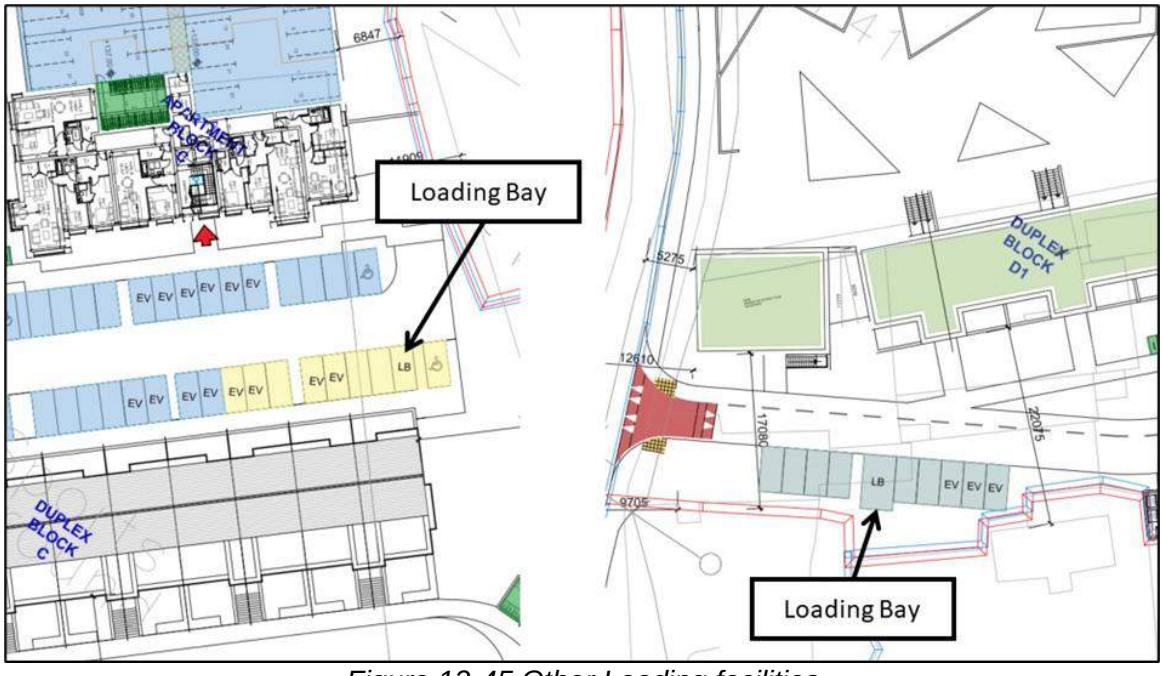

Figure 12-45 Other Loading facilities

12.1.4.8 Parking Provisions

Car and cycle parking for residential houses and non-residential elements will be provided for in line with the parking standards set out in the Dun Laoghaire Rathdown County Development Plan and the Department of Housing Planning and Local Governments (DHPLG) document 'Design Standards for New Apartments'

12.1.4.8.1 Residential Car Parking

The relevant residential car parking provision for the DLRCC Development Plan (Table 12.5 of the CDP) are shown in Table 12-15,while the standards as set out in the DHPLG for New Apartments are shown in Table 12-16. As set out in Development Plan Section 12.1.4.5.1, Parking Zones, the development is located in Parking Zone 3. Zone 3 is characterised by:

- Access to a level of existing or planned public transport services;
- A reasonable level of service accessibility, existing and planned, by walking or cycling; and
- A capacity to accommodate a higher density of development than rural areas.

Table 12-15 DLRCC - Car Parking Standards

		DLRCC Development Plan 2022-2028 – Zone 3		
Type	No. Units / Area	Parking Standard	Visitor Car Parking	Potential Car Parking Spaces
1 Bed Apartment / Duplex	27	1 space per unit	Plus 1 in 10 visitor parking in zone 3	30
2 Bed Apartment / Duplex	128	1 space per unit	Plus 1 in 10 visitor parking in zone 3	141
3 bed + Apartment / Duplex	63	2 spaces per 1 unit	Plus 1 in 10 visitor parking in zone 3	139
3 Bed or more Houses	165	2 spaces per 1 unit	N/A	330
Total	383			640

Based on the DLRCC Development Plan the Proposed Development could provide 640No. residential car parking space.

Table 12-16 DHPLG: Design Standards for New Apartments

DHPLG: Design Standards for new Apartments					
Type	Beds	No. Units / Area	Parking Standard	Factor	Potential Parking Provision
Apartments / Duplex	1	27	1 space per unit	1	27
Apartments /Duplex	2	128	1 space per unit	1	128
Apartments / Duplex	3	63	1 space per unit	1	63
Total		218			218

Based on the DHPLG Design Standards for New Apartments the Proposed Development could provide 218No. apartment / duplex[19] car parking spaces.

The subject scheme proposes car parking as set out in Table 12-17.

Table 12-17 Proposed Residential Car Parking

Unit Type	Car Parking	Visitor Parking	Total
House	330	N/A	330
Duplex	109	38	147
Apartments	112	32	144
	551	70	621

Excluding visitor car parking the Proposed Development provides:

- 330 No. car-parking spaces to serve the 165 No. houses which is in accordance with the Development Plan standards (2 No. per unit)
- 221 No. car parking spaces to serve 218 No. apartment and duplex units at a ratio of 1 spaces per unit.
- 70No. visitor car parking spaces to serve 218No. apartment and duplex units at a ratio of 0.32 per unit.

Section 12.4.5.2 of the Dún Laoghaire-Rathdown County Development Plan 2022-2028 further outlines that car parking provision can be reduced in certain circumstances as shown in Table 12-18.

Table 12-18 DLRRC Development Plan - car parking reduction criteria

Section 12.4.5.2 Reduction in car parking provision criteria	Our Response
Proximity to public transport services and level of service and interchange available.	Number of bus services located in the vicinity of the site and Ballyogan Wood Luas stop within 2km on bus routes – see Section 12.1.3.2.
Walking and cycling accessibility/permeability and any improvement to same.	Good existing walking facilities as outlined in Section and significant improvements to walking and cycling proposed Section 12.1.3.1 & 12.1.3.6.2 including GDRS facilities.
The need to safeguard investment in sustainable transport and encourage a modal shift.	Level of car parking looks to balance between provision of necessary amount while not adversely impacting on encouraging mode shift.
Availability of car sharing and bike / e-bike sharing facilities.	Car Sharing facility provided on site subject to agreement with share provider.
Existing availability of parking and its potential for dual use.	Mixed use nature of the development with different land uses and car parking demand and utilisation provides flexibility.
The range of services available within the area.	Development provides creche, office, medical, community and retail use which would facilitate

[19] DHPLG –Design Standards for new Apartments does not have a standard for houses so this number is excluded from this maxima figure

	internal trips reducing car trips and car ownership ship.
Impact on traffic safety and the amenities of the area.	Level of car parking is balance so as to not adversely impact on safety,
Capacity of the surrounding road network.	Reduced car parking versus DLRCC max standards will result in few trips on the network that will have a positive impact on capacity versus higher parking version.
Urban design, regeneration and civic benefits including street vibrancy.	Level of car parking is a balance to achieving an optimal urban realm that includes landscaping and amenity, play, safety and place making.
Robustness of Mobility Management Plan to support the development.	An outline MMP is provided as part of the planning application.
The availability of on street parking controls in the immediate vicinity.	N/A
Any specific sustainability measures being implemented including but not limited to: The provision of bespoke public transport services. The provision of bespoke mobility interventions.	N/A

Having regard to Section 12.4.5.2 of the Development Plan, as set out in our responses in Table 12-18 a reduced provision of car parking versus the DLRCC Development Plan standard car parking standards is justified.

Paragraph 4.22 and 4.23 of the Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (December, 2020) ("Apartment Guidelines, 2020") states the following in relation to 'Peripheral and/or Less Accessible Urban Locations (which is the location of the subject lands):

'*As a benchmark guideline for apartments in relatively peripheral or less accessible urban locations, one car parking space per unit, together with an element of visitor parking, such as one space for every 3-4 apartments, should generally be required.*

For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure, where possible, the provision of an appropriate number of drop off, service, visitor parking spaces and parking for the mobility impaired. Provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles and cycle parking and secure storage. It is also a requirement to demonstrate specific measures that enable car parking provision to be reduced or avoided.'

The parking ratio outlined above for the proposed apartments is in accordance with the Apartment Guidelines, 2020, in that it provides

- 221 No. car parking spaces to serve 218 No. apartment and duplex units at a ratio of 1 space per unit.
- 70No. visitor car parking spaces to serve 218No. apartment and duplex units at a ratio of 0.32 per unit.

The location of car parking spaces and the car parking allocation can be seen on drawings prepared by the Architect MCORM (Ref MCORM PL601 –Car Parking Plan). This drawing is submitted separately in support of this planning application.

In accordance with the County Development Plan Section 12.4.5.3 a 4% of car parking provision shall be suitable for use by disabled person. It is considered that all residential in-curtilage car parking spaces are adaptable for universal access. Based on the remaining car parking spaces 4% equates to 12No spaces are provide within the development.

The location of disabled car parking spaces and the car parking allocation can be seen on Architects drawings (Ref MCORM PL601 –Car Parking Plan). This drawing is submitted separately in support of this planning application.

Electric Car (E-Car) charging points are provided in accordance with Section 12.4.11 (Electrically Operated Vehicles) of the Dún Laoghaire-Rathdown County Development Plan 2022-2028 which states the following:

"Residential multi-unit developments both new buildings and buildings undergoing major renovations (with private car spaces including visitor car parking spaces) - a minimum of one car parking space per five car parking spaces should be equipped with one fully functional EV. Charging Point. Ducting for every parking space shall also be provided."

Therefore, 61No. of the residential car parking spaces shall be equipped with charging points. Additional ducting will be provided to allow for retrospective installation of additional charging points. In curtilage car parking spaces can easily be EV compliant. Specific EV charging facilities will be provided in the residential undercroft parking areas.

The location of disabled car parking spaces and the car parking allocation can be seen on drawings prepared by Architect MCORM (Ref MCORM PL601 –Car Parking Plan). This drawing is submitted separately in support of this planning application.

The County Development Plan Section 12.4.7 states the following in relation to Motorcycle Parking:

"It is an objective of the Council to require developments to provide motorcycle parking spaces at a minimum of four or more spaces per 100 car parking spaces"

Assuming motorcycle parking for residential dwellings can be accommodated with the curtilage of that dwelling the above standard has been applied to remaining car parking spaces. Using this rate, a minimum of 12No. motorcycle parking spaces is required. The location of motorcycle parking spaces and the car parking allocation can be seen on Architects drawings (Ref MCORM PL601 –Car Parking Plan).

12.1.4.8.2 Non-Residential Car Parking

The relevant non-residential car parking provision for the DLRCC Development Plan (Table 12.5) are shown in Table 12-19.

Table 12-19 DLRCC Development Plan Non-residential car parking

Land Use	Gross Floor Area sqm	DLRCC Standard	Car Parking
Creche	439	1 space per 40 sqm	11
Office	317	1 space per 100 sqm	4
Medical	147	2 spaces per consulting room	2
Retail	857	1 space per 50 sqm	18
Retail Convenience	431	1 space per 30 sqm	15
Community	321	1 space per 50sqm	7
Total	2512sqm		57

Based on the current DLRCC Development Plan the Proposed Development could provide a maximum of 57No. non- residential car parking spaces.

The Proposed Development is proposing to provide 57No. non-residential car parking spaces which accords with the DLRCC maximum car parking standards.

Electric Car (E-Car) charging points are provided in accordance with Section 12.4.11 (Electrically Operated Vehicles) of the Dún Laoghaire-Rathdown County Development Plan 2022-2028 which states the following.

"Developments with publicly accessible spaces (e.g. supermarket car park, cinema etc.) - provide at least 1 recharging point and a minimum of one car parking space per five car parking spaces should be equipped with one fully functional EV Charging Point"

The development proposed to provide 12No. of the 57No. retail spaces will be equipped with charging points.

In accordance with Section 12.4.5.3 of Dún Laoghaire-Rathdown County Development Plan 2022-2028

- 4% of parking should be suitable by disabled – 4No. spaces are provided
- 4% should be reserved for parent and child - 3No. spaces are provided

12.1.4.8.3 Total Development Car Parking

The total development car parking for both residential and non-residential uses is shown in Table 12-20.

Table 12-20 Total Development Car Parking Provision

Residential Car Parking Provision	621
Non -residential Car Parking Provision	57
Total Development Car Parking	678

The location of these car parking spaces, and the car parking allocation can be seen on Architect MCORM drawing (Ref MCORM PL601 – Parking Allocation). This drawing is submitted separately in support of this planning application.

12.1.4.8.4 Cycle Parking

Bicycle parking is provided for all residential units (apartments, duplexes and housing units) and for visitors in accordance with the cycle parking standards set out in the DLR Standards for Cycle Parking and associated Cycling Facilities for New Developments (Table 4-1).

The parking requirements for the above-mentioned standards are given in Table 12-21.

Table 12-21 DLR Cycle Parking Standards

Land use	Short Stay	Long Stay
Apartments, Flats, Sheltered housing	1 space per 5 units	1 space per unit
Houses – 2 bed dwelling	1 space per 5 units	1 space per unit
Houses – 3+ bed dwelling	1 space per 5 units	1 space per unit

The development proposes to provide residential cycle parking in accordance with the ratio set out in Table 12-22, which accords with the ratio in the DLR Cycle Standards as set out in Table 12-21.

Table 12-22 Proposed Residential Cycle Parking Ratio

Type	Rate
Houses	In curtilage > 1 space per unit
Duplex	1 space per unit
Duplex Visitor	0.2 space per unit (i.e., 1 per 5 units)
Apartment	1 space per unit
Apartment Visitor	0.2 space per unit (i.e., 1 per 5 units)

The proposed allocation of cycle parking for the development is shown in Table 12-23.

Table 12-23 Proposed Apartment and Duplex Cycle Parking

Type	Units	Long Stay	Visitor	Total
Houses	165	165	33	198
Apartments & Duplex	218	223	52	275
Total	383	388	85	473

Long stay cycle parking is provide in secure, sheltered and accessible locations, while visitor parking is interspersed at appropriate locations in the development to reflect likely locations of demand.

The location of cycle parking spaces and the car parking allocation can be seen on Architect MCORM drawing (Ref MCORM PL601 – Parking Allocation) and Atkins drawing (5158632/HTR/DR/02/0128 and 0129). These drawings are submitted separately in support of this planning application.

Bicycle parking is provided for all non- residential units (in accordance with the cycle parking standards set out in the DLR Standards for Cycle Parking and associated Cycling Facilities for New Developments (Table 4-2)).

The parking requirements for the above-mentioned standards are given in Table 12-24.

Table 12-24 DLR - Non Residential Cycle Standards

Uses	Short Stay	Long Stay
Retail	1 space per 100sqm	1 space per 5 staff
Retail Convenience	1 space per 100sqm	1 space per 5 staff
Medical Centre	1 space per 2 consulting rooms	1 space per 5 staff
Office	1 space per 200sqm	1 space per 200sqm
Creche	1 space per 10 children	1 space per 5 staff
Community	1 space per 100sqm	1 space per 5 staff

The proposed allocation of cycle parking for non-residential uses is shown in Table 12-25. The ratio accords with DLR standards shown in Table 12-24.

Table 12-25 Non-Residential Cycle Provision

Uses	Long Stay	Short Stay
Retail	6	9
Retail Convenience	4	4
Medical Centre	2	2
Office	2	2
Creche	15	9
Community	2	6
Total	31	32

For non-residential uses the Proposed Development will provide a total of 63No. cycle spaces made up of 31No. long stay space for staff and 32No.short stay (visitor) spaces. This accords with DLR standards shown in Table 12-24.

12.1.5 Potential Impact of the Proposed Development

12.1.5.1 Construction Phase

The traffic that would be generated during construction of the development is predicted on the basis of an outline construction programme and activity schedule for the Proposed Development as set out below.

Further details of construction activity are set out in the Construction Environmental Management Plan (CEMP) and Outline Construction Management Plan that are submitted in support of this EIAR.

The transport effects of the Proposed Development during the demolition and construction phases are considered through the following key transportation issues:

- Vehicle routing;
- Demolition and construction traffic impacts;
- Pedestrian and cycle impacts; and

- Public transport impacts.

It is assumed that all demolition and construction vehicles will remain on the strategic road network for as long as possible and that the "last mile" will be undertaken on local roads (i.e.: that all construction traffic will approach the site from the M50 corridor). During the demolition and construction of the Proposed Development there is the potential for temporary local disruption to pedestrian, cycle and vehicular traffic users because of demolition and construction traffic. The likely traffic impact of the construction works will be short-term in nature.

Once a contractor has been appointed the details set out below will be reviewed and updated to reflect contractor advise and requirements in lien with best practice safety and environmental practices.

12.1.5.1.1 Construction Phasing and programme

The construction phasing strategy and programme for the Proposed Development is outlined in Section 12.1.4.1. The construction of the development is anticipated to run for five years between April 2023 and April 2028 covering five phases of development.

12.1.5.1.2 Site Compound

A construction site compound will be established at the site and the working area fenced off to provide a secure site. Due to the scale of development and the phased approach to development this compound will move positions throughout the construction period. An indicative construction site compound strategy is shown in Figure 12-46.

The construction compound will accommodate a site office and staff welfare facilities (including a canteen, drying room, toilets and first aid) as well as storage areas for materials, waste areas and plant and machinery. All surplus plant and materials will be stored in this location when not in use and will be secured here at night when the site is not operational.

Outside of the main construction compound locations, there may be a number of smaller local work compounds throughout the site which may be used by the Contractor for staff welfare facilities, to store materials for short term use and for plant to park overnight.

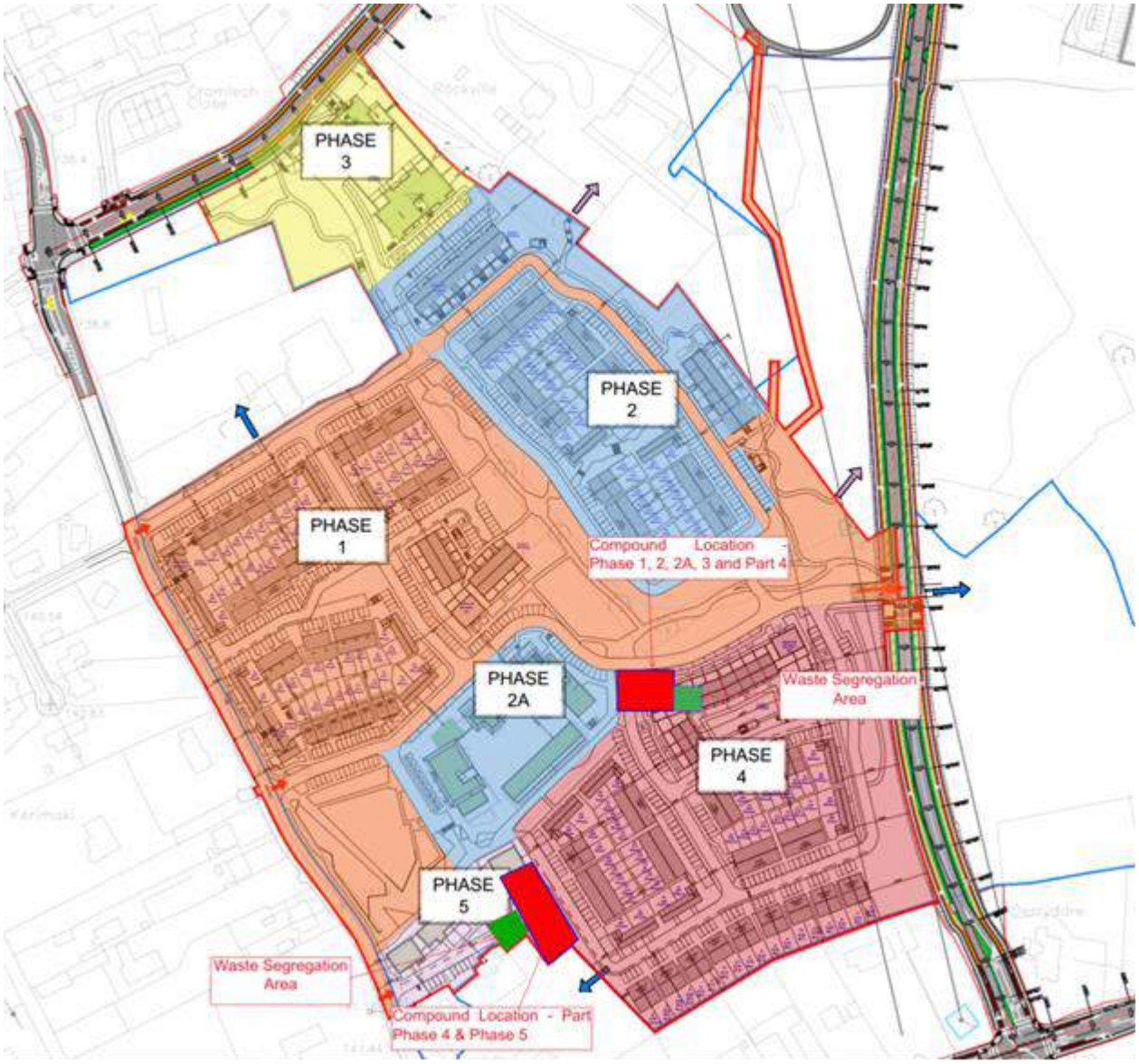

Figure 12-46 Indicative Construction Site Compound

12.1.5.1.3 Construction Hours

The timing of construction activities, working hours and the rate of progress of construction works are a balance between efficiency of construction and minimising the impact on the local community and road users. Constraints will be specified in the contract documents, generally restricting working hours on the Proposed Development.

Typically, construction working hours adjacent to residential areas or sensitive noise receptors will be limited to:

- 7am - 7pm, Monday to Friday; and
- 7am - 2 pm, Saturday
- Sunday – no working

- Bank and Public Holidays – no working

Occasional long working days or abnormal hours may be required from time to time. Given the nature of construction and a range of influencing factors it is not possible to predict or programme far in advance the exact dates on which extended construction hours will be necessary. It is proposed that the developer however will provide notification to the Planning Authority a week in advance of these occurrences.

12.1.5.1.4 Construction Haul Routes

For phase 1 it has been assumed that the Glenamuck District Roads Scheme (GDRS) is not available and therefore it is likely that HGV's will utilise Junction 15 of the M50, coming from the northerly or southerly direction to access the Glenamuck Road North Roundabout and travel westerly along the Glenamuck Road before accessing the R117 and entering the Proposed Development site. HGV's leaving the site are likely to utilise the same route in reverse.

For Phase 2 to 5 it has been assumed that the GDRS will be available as outlined in Section 12.1.3.6.1. Therefore, it is likely that HGV's will utilise Junction 15 of the M50, coming from the northerly or southerly direction to access the Glenamuck Road, before accessing the Glenamuck District Distributor Road (GDDR) and from there the Glenamuck Link Distributor Road (GLDR) before accessing the site via new junction onto the GLDR. HGV's leaving the site are likely to utilise the same route in reverse. The proposed haul route is shown in Figure 12-47.

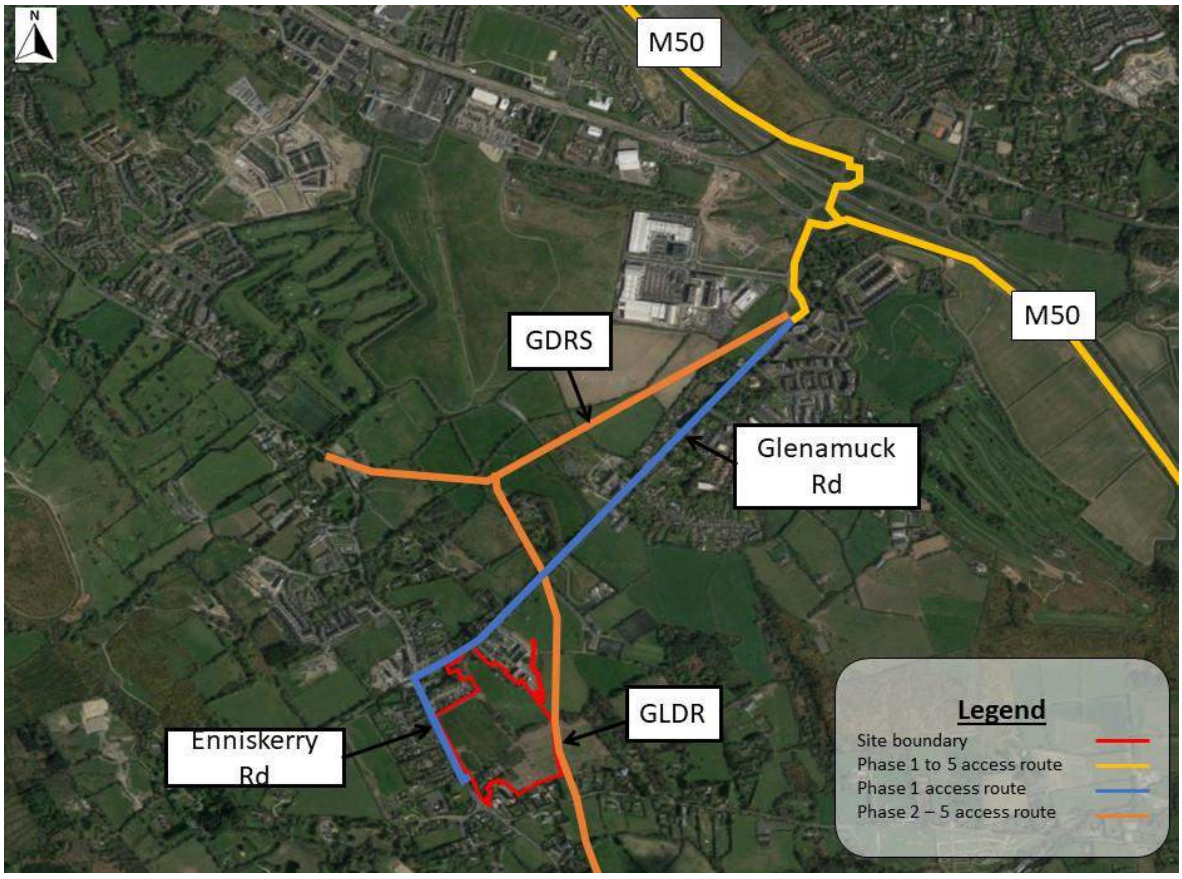

Figure 12-47 Construction Haul Routes

12.1.5.1.5 Anticipated Construction Traffic

Based on a cut and fill exercise for the full development it is anticipated that volumes outlined in Table 12-26.

Table 12-26 Cut and Fill Volumes

Kilternan Summary Cut/ Fill				
Phase	Exported off Site (cubic metres)	Fill Material (cubic metres)	Total Volumes in / out per phase	Phase Duration (months)
1	15,600	21,998	37,598	18
2	6,504	13,180	19,684	24
2a	1,846	4.566	6,412	
3	4959	2,832	7,529	12
4	10,099	18,922	29,021	26
5	1,842	2,102	3,944	8
	40850	63,600	104,450	

Therefore, a total of 40,850 cubic metres of material will be required to be exported off site and 63,600 cubic material required to construct building up to finish floor level (grey slap). Anticipated HGV movements associated with this volume have been estimated based following steps:

1. Total volumes divided by
    - Average number of construction days per month – 20 days
    - Construction time period of phase
2. This provides average volume moved per day
3. Average truck capacity is 25 tons with soil density of 1.9kg/m3 provide a cubic capacity of 13 cubic metres per truck
4. Assumed all trips will be two-way there both an inward and outward trip will be required
5. Phase 2 and 2a will run concurrently.

Based on this the HGV movements per phase are set out in Table 12-27.

Table 12-27 HGV daily two -way movements associated with exported & import of material

Phase	IN	Out	Total
1	8	10	18
2 and 2a	6	8	14
3	4	2	6
4	4	6	10
5	2	4	6
Total	24	30	54

Other materials delivered by HGV in significant quantities throughout a project would include stone fill, steel reinforcement, blocks and bricks, mortar, precast concrete floors and balconies, timber

and roof trusses, windows and cladding, roof tiles/slates, paving and drainage materials. Materials for general internal finishes would tend to be in smaller vehicles but some of the bulkier items would include timber, plaster slabs, kitchens and wardrobes, bathrooms and plumbing supplies. However, these vehicle movements will be spread out over the entire duration of the programme (five years) with vehicle numbers not anticipated to be as numerous or as prolonged as the two scenarios outlined above. As an estimate, it is assumed that there would be circa 12 two-way vehicle movements over a typical construction day. It is anticipated that these vehicle movements would occur outside peak times of avoid delays on the road network and minimise lost time and costs.

In terms of construction personnel, it is anticipated that circa 100 people would be employed on site during peak periods. Table 12-28 outlines the anticipated movements.

Table 12-28 Construction Personnel Movements

Number of Construction Staff	100
Average Car Occupancy	3
Percentage Arriving by Public Transport	10%
Daily Number of Public Transport Trips (for construction)	100
Percentage Arriving by Public Car	90%
Daily Number of Car Trips (for construction)	30
Arrival Profile	
0700-0800	80%
0800-0900	20%
Departure Profile	
1600-1700	10%
1700-1800	10%
1800-1900	80%

Based on the above analysis the anticipated peak construction activity profile is shown in Table 12-29 for Phase 1. Phase 1 is shown for the following reasons:

- Represents the greatest number of HGV movements for cut & fill;
- Vehicles are anticipated to route through local road network including Enniskerry Road / Glenamuck Road junction (Golden ball); and
- Other phases 2 to 5 – access is via the GLDR.

Therefore, construction impacts during phase 1 are anticipated to show the worst case impact scenario.

Table 12-29 Anticipated Total Construction Vehicle Movements

	Cut & Fill		**Other Construction**		**Construction Personnel (car)**		**Total Vehicles**	
	In	Out	In	Out	In	Out	In	Out
Time		0						
0700-0800	1		1	1	24		26	1

0800-0900	1	1			6		7	1
0900-1000	1	1	1	1			2	2
1000-1100	1	1	1	1			2	2
1100-1200	1	1	1	1			2	2
1200-1300	1	1	1	1			2	2
1300-1400	1	1	1	1			2	2
1400-1500	1	1					1	1
1500-1600	1	1					1	1
1600-1700		1				3	0	4
1700-1800						3	0	3
1800-1900						24	0	24
Total	9	9	6	6	30	30	45	45

Based on the above volumes the number of traffic movements to and from the site the construction traffic impact for the AM and PM peak period has been calculated. In order to understand a worst case scenario, it has been assumed that the peak impact occurs during Phase1 when the GDRS is not available and therefore all construction traffic must access the site through the Golden Ball Junction. Construction vehicles have been converted to PCU as follows:

- Construction Personnel vehicles assumed to be 1 PCU; and
- All other construction vehicles assumed to be 2 PCU.

Network peak times are 08:00 -09:00 in the AM and 17:00 – 18:00 in the PM period. Table 12-30 shows peak construction traffic movements in PCU.

Table 12-30 Peak Construction Traffic in PCU

	In movements (PCU)	Out movements (PCU)
AM Peak 08:00 -09:00	8	2
PM Peak 17:00-18:00	0	3

Phase 1 Construction Vehicle routing through the Golden Ball junction is shown in Figure 12-48.

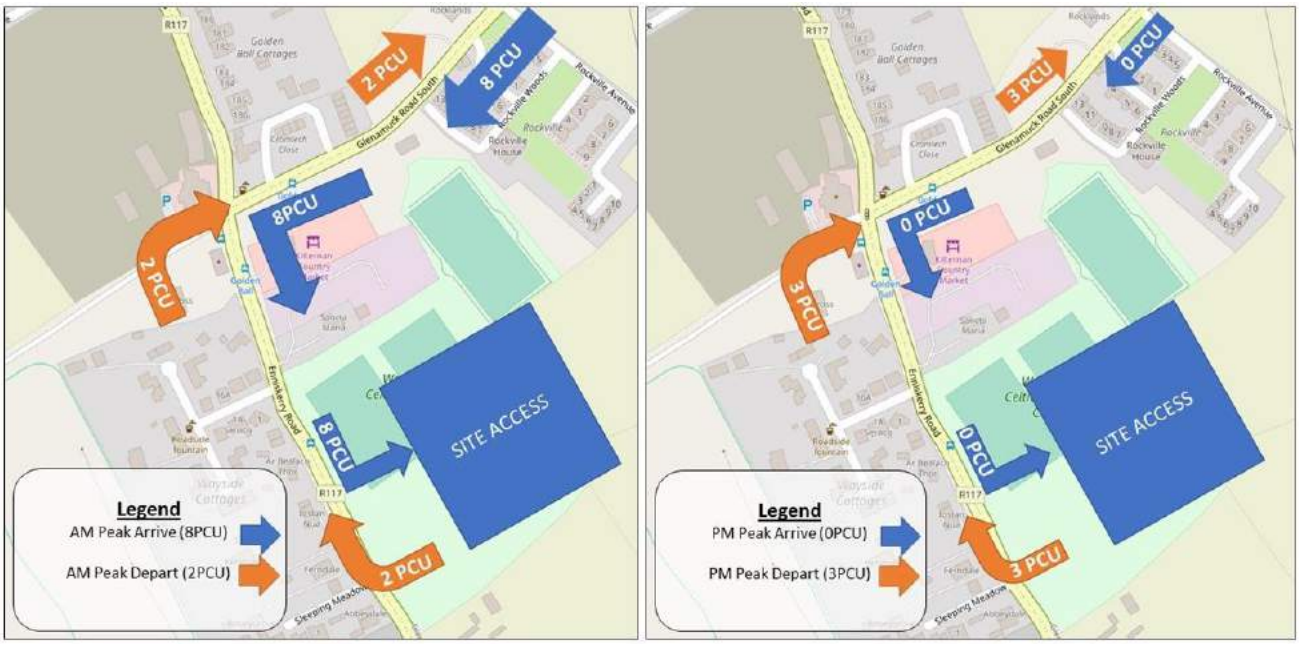

Figure 12-48 Construction Traffic Movements

12.1.5.1.6 Construction Traffic Impacts

Based on the construction traffic flows shown above the traffic impacts at the Golden Ball junction is shown in Table 12-31.

Table 12-31 Impact of Construction Traffic at Golden Ball Jct

	Time Period	Existing Traffic Volumes PCU	Construction Traffic PCU	% Impact
Glenamuck / Enniskerry Jct Golden Ball Junction	AM (0800-0900)	1252	10	0.80%
	PM (1700-1800)	1078	3	0.28%

As shown in Table 12-31 the construction traffic impact on the Glenamuck / Enniskerry Road (Golden Ball) junction is negligible with a maximum increase of 0.8% experienced in the AM peak period.

The potential traffic impact from the development is below the thresholds set out in TII's Transport Assessment Guidelines Table 2.1 Traffic Management Guidelines Thresholds for Transport Assessments that states that assessment is required if:

- Traffic to and from the development exceeds 10 percent of the traffic flow on the adjoining road; and
- Traffic to and from the development exceeds 5 percent of the traffic flow on the adjoining road where congestion exists of the location is sensitive.

Based on this threshold the construction impacts on the local road network are considered to be negligible.

12.1.5.2 Operational Phase

This section outlines the transport and traffic impact from the Proposed Development on the transport network with in the study area as defined in Section 12.1.2.2.

12.1.5.2.1 Background Traffic Growth

The baseline traffic has then been grown in accordance with the growth of the number of trips per day per the NTA National Demand Forecasting Model which is shown in the Figure 12-1.

Based on the Figure 12-1, the growth in number of trips per day for the Reference Case (Blue line) is summarised in Table 12-32.

Table 12-32 Growth in number of trips per day (NTA National forecasting Model)

Year	Person Trip	Growth Rate over 10 years
2020	4,600,000	
2030	5,000,000	0.087
2040	5,400,000	0.080
2050	5,800,000	0.074
Average growth over each 10 year period		0.080
Average growth per year		0.008
Growth Factor		**1.008**

Based on the above table, the number of trips per day is expected to increase by a factor of approximately 0.8% per year. The trips per day consist of all modes of transport including cars, public transport, and active mode of travel. Thus, the actual growth per mode may differ. In reality, considering modal shift targets and national policy, it is likely that the vehicle trip growth rate will be less than the overall trip growth rate. However, taking a conservative approach, it has been assumed that the overall growth factor applies to the baseline traffic.

12.1.5.2.2 Modelled Scenarios

The model was run for following scenarios for both AM and PM peak:

- Opening Year (2024) – Background Growth + Committed Development without GDRS
- Opening Year (2024) – Background Growth + All Development without GDRS
- Opening Year (2024) – Background Growth + Committed Development with GDRS
- Opening Year (2024) – Background Growth + All Development with GDRS
- Opening Year+5 (2029) – Background Growth + Committed Development with GDRS
- Opening Year+5 (2029) – Background Growth + All Development with GDRS
- Opening Year+15 (2039) – Background Growth + Committed Development with GDRS
- Opening Year+15 (2039) – Background Growth + All Development with GDRS

The committed development scenarios include the developments that have recently been granted planning permission in the vicinity of the Proposed Development that will result in additional traffic at key junctions. The All development scenarios consist of the traffic associated with the proposed mixed use development and trips associated with the committed development.

It is important to note that as stated in Section 9 of the Environment & Modelling Report accompanying the GDRS Part 8 Scheme the impact of the full build out of the Glenamuck / Enniskerry LAP on the surrounding and strategic road network. The Part 8 Scheme accounted for some 1050 units within the LAP lands that includes the Kilternan Masterplan lands quantum of development. The provision of the GDRS road network will therefore provide sufficient capacity on the road network for all the LAP lands including this Proposed Development.

In the medium to longer term the construction of the Glenamuck District Roads Scheme will reduce traffic volumes along both Glenamuck Road and Enniskerry Road as shown in Section 12.1.4.5. As such the medium to longer term impact of the Proposed Development on the local road network is already addressed by the distributor schemes and the accompanying Modelling Report (Review of Glenamuck Local Area Plan – Traffic Modelling Report; Dun Laoghaire Rathdown County Council May 2013).

Therefore, in the context of the changing and improving local road network, the impact of the Proposed Development only needs to be addressed in the short to medium term context of its impact on both the Glenamuck Road and Enniskerry Road post construction of the Part 8 Scheme and prior to completion of the two distributor roads.

The timeframe for the completion of GDRS is Q3 2024. This ties into the opening time for phase1 of the development. However, in case there is a delay to delivery of the GDRS we have separate scenarios: one “without GDRS” and one “with GDRS” for the Phase1 lands.

For Opening+5 and+15 year scenarios, it is assumed that GDRS will be completed.

The details about the developments (committed and Proposed Development) are summarised in the following sections.

12.1.5.2.3 Development Quantum and Phasing

As stated in Section 12.1.4.1, the mixed use development consists of 5 phases. By the opening year scenarios, Phase 1 developments are supposed to be developed. By other design year scenarios (Opening+5 and Opening+15), all the Phase 1 to 5 developments are supposed to be developed as shown in Table 12-33.

Table 12-33 Development Quantum and Phasing

Phase	Developments	Units/Area
Opening Year (2024)		
Phase 1	Apartments	0 unit
	Duplexes	32 units
	Houses	59 units
Opening Year +5 (2029) and Opening Year + 15 (2039)		
Phase 1 to 5	Apartments	100 units
	Duplexes	118 units
	Houses	165 units
	Creche	439 sq. m.
	Office	317 sq. m.
	Medical	147 sq. m
	Retail	857 sq. m.
	Retail (Convenience)	431 sq. m.
	Community	321 sq. m.

12.1.5.2.4 Committed Development

Committed developments are the additional developments that have recently been granted planning permission in the vicinity of the Proposed Development that will result in additional traffic at key junctions in the vicinity of the site. These developments are summarised in Figure 12-49 with their planning references and detailed below.

- **Site 1: ABP30984621 –** It consists of 203-unit residential development and a 380m2 neighbourhood focussed creche at Enniskerry Road, Kilternan, Co. Dublin.
- **Site 2: ABP30616019 –** It consists of residential development of 197 residential units comprising 62 no. housing units and 135 no. apartment units.
- **Site 2: ABP30397819 –** It consists of residential development of 203 residential units comprising 30 no. housing units and 173 no. apartment units
- **Site 3: D18A/1133 –** It consists of Mixed Use Development including 61 no. residential units comprising 20 housing units and 41 no. apartment / duplex units including the partial demolition & reconfiguration of the existing Golden Tavern Public House to include 292.7sqm public house and 304sqm of office use.
- **Site 4: D19A/0242 –** It consists of Residential Development of 51 residential units comprising 39 no. housing units and 12 no. apartment units.
- **Site 5: ABP30704320 –** It Consists of Residential Development of 116 residential units comprising 85 no. houses and 31 no. apartments

- **Site 6: ABP31221421** – It consists of construction of 203 residential units (comprising 30 houses and 173 apartments, the provision of a creche/childcare facility, the provision of a retail unit, and the provision of a social/amenity facility.

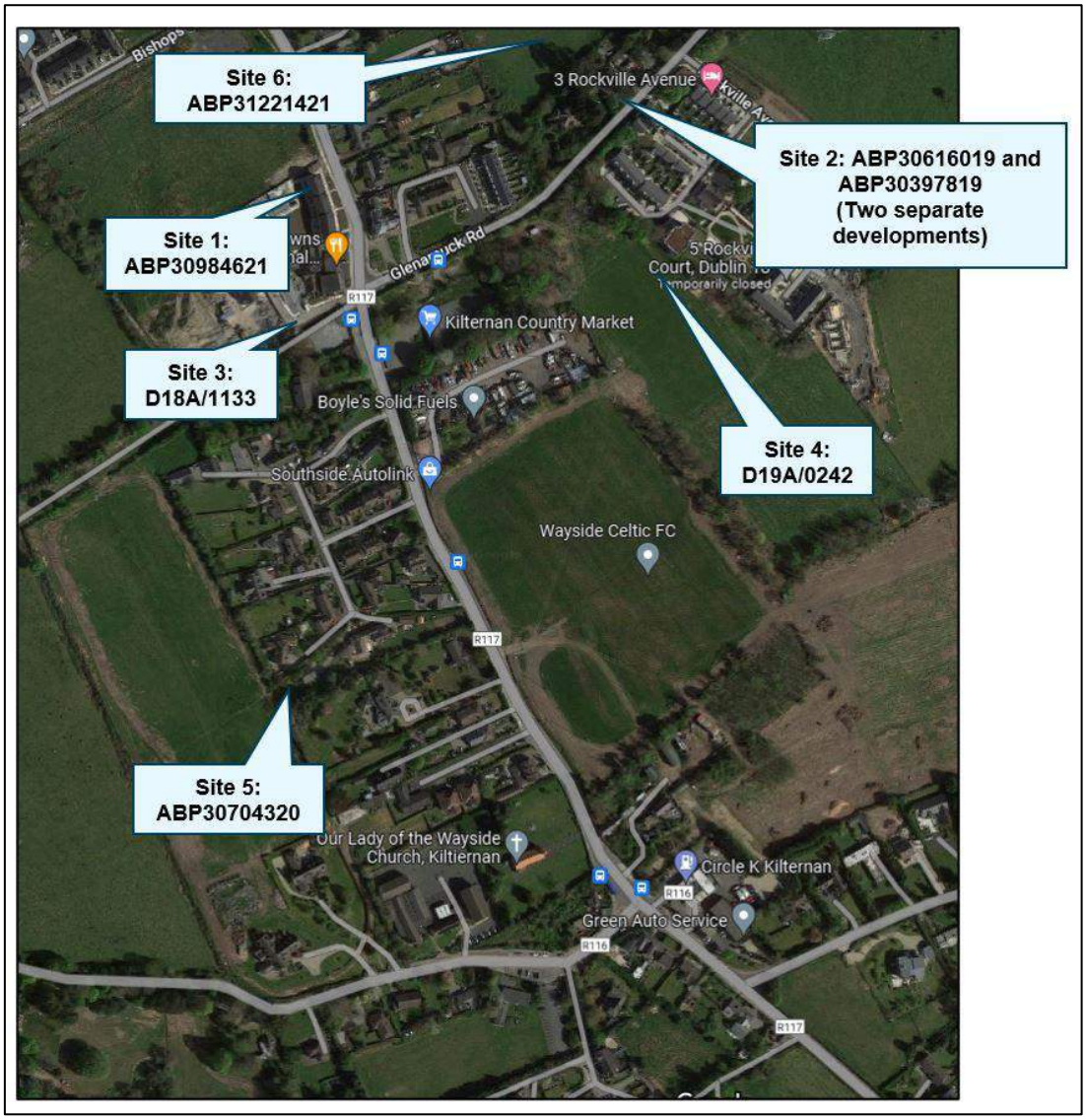

Figure 12-49 Relevant Committed Development

12.1.5.2.5 Mode Share

The existing mode share for the Proposed Development site has been taken from the CSO Census 2016 'Small Areas' data. A review of the 'Small Areas' (SA) adjacent to the site were reviewed and amalgamated to derive an appropriate mode share. These small areas are shown in Figure 12-50.

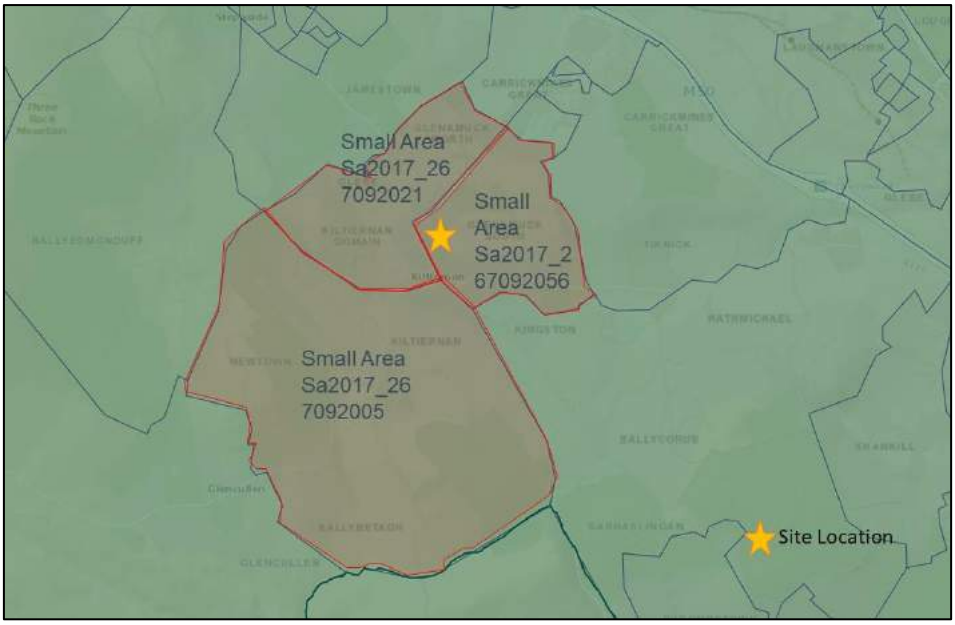

Figure 12-50 CSO Small Area Populations Map

These SA's were chosen as the locations shares similar characteristics with the Proposed Development site as outlined below:

- Proximity To the site;
- Proximity to Public Transport; and
- Parking Characteristics.

The amalgamation of the above Small Area Population (SAP) results in the mode share shown in Figure 12-51.

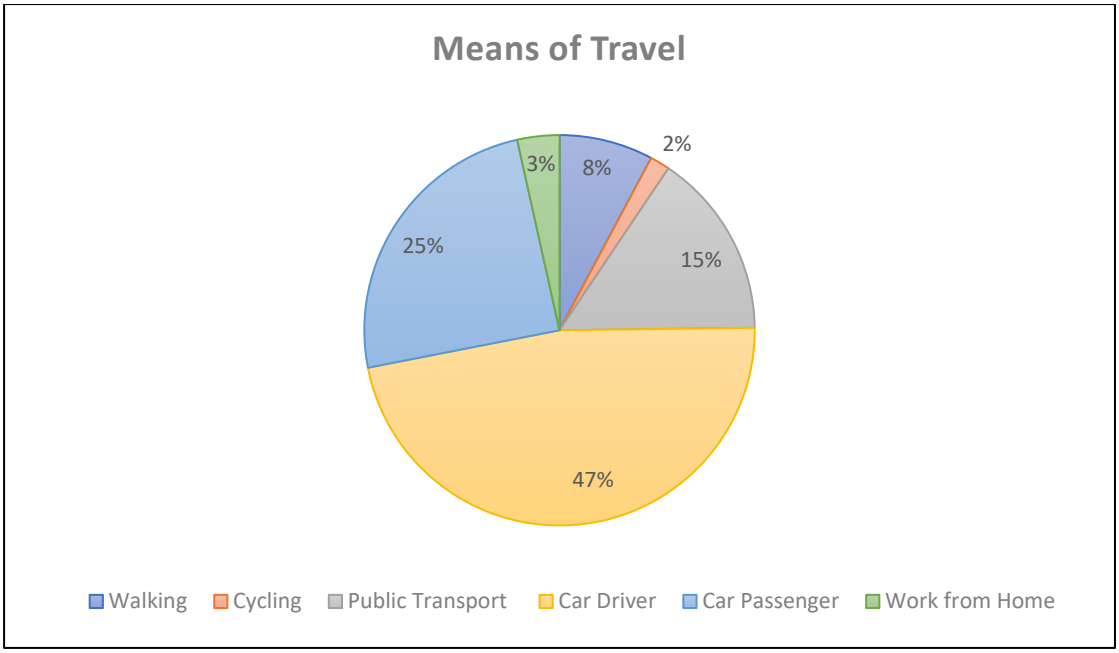

Figure 12-51 SAP Mode Share

It is reasonable to assume that the Proposed Development will deliver similar mode shares as detailed in Figure 12-51.

In order to understand the potential impact, we need to understand potential trip rates and trip generation from the development.

12.1.5.2.6 Trip Rates and Traffic Generation

A trip rate estimation has been undertaken using TRICS. (Trip Rate Information Computer System) v7.8.1 online system.

The person trip rate for the residential developments was estimated using the TRICS (Trip Rate Information Computer System) database using the "Residential – Houses Privately Owned" and "Residential – Flats Privately Owned" subcategories respectively for Houses and Apartment Units. The direct output from TRICS is included in Appendix A of the Traffic and Transport Assessment submitted as a standalone report in support of this planning application and is summarised in the Table 12-34.

Table 12-34 People Trip Rates from TRICS- Residential Development

Period	TRICS Trip Rates (People)	
	Arrivals	Departures
Apartments		
AM Peak	0.141	0.341
PM Peak	0.412	0.212
Houses		
AM Peak	0.238	0.89
PM Peak	0.659	0.31

TRICS database were again used to determine the vehicle trips rates for the non- residential developments. The categories sued for estimating trips rate were:

- **Retail – Shopping Centre: Local Shops** for Retail
- **Education – Nursery** for Creche
- **Health/Clinic** for Medical facilities
- **Employment – Office** for Office trips
- **Retail – Convenience Store** for convenience stores.

For Community development no trips were assumed as these trips will be internal. The vehicle trip rate associated with all these non-residential development lands are summarised in Table 12-35.

Table 12-35 TRCIS Vehicle Trip Rates - Non-Residential Uses

Usage	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Retail	3.482	3.261	6.11	5.92
Creche	2.4	1.657	2	2.171
Medical	0.725	0	0.415	0.518
Office	2.157	0.092	0.118	1.947
Convenience stores	5.826	5.404	5.601	6.079

Since, the trip rate for these developments are people trip rate, the number of person trips were calculated for all design years and are summarise in the Table 12-36. Since, duplexes resemble to apartments more than individual houses, a trip rate for apartments were used.

Table 12-36 People Trip Rates for Residential Uses

Development types	No. Of Dwells	AM Peak		PM Peak	
		Arrivals	Departures	Arrivals	Departures
Opening Year – Phase 1 only					
Apartments	0	0	0	0	0
Duplexes	32	5	11	13	7
Houses	59	14	53	39	18
Total	91	19	63	52	25
Opening Year+5 and +15 – Phase 1 to Phase 5					
Apartments	100	14	34	41	21
Duplexes	118	17	40	49	25
Houses	165	39	147	109	51
Total	383	70	221	199	97

These people trips are multiplied with the percentage of cars mode share shown in Section 12.1.5.2.5 to estimate the vehicle trips generation as shown in Table 12-37.

Table 12-37 Residential Vehicle Trip Generation

Development	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Opening Year						
Apartments	0	0	0	0	0	0
Duplexes	2	5	7	6	3	9
Houses	7	25	32	18	9	27
Total	9	30	39	24	12	36
Opening Year +5 and +15						
Apartments	7	16	23	19	10	29
Duplexes	8	19	27	23	12	35
Houses	18	69	87	51	24	75
Total	33	104	137	93	46	139

The vehicle trips associated with Non-residential uses are shown in Table 12-38. Based on Phasing Plan outlined previously the non-residential uses will be available in the “open year +5” and “open year +15” scenarios only. That is, they are no available during opening year scenario (2024). As stated in the previous sections no trips are assumed for community development as they will be internal and mostly during off-peak hours being assessed.

Table 12-38 Non-Residential Vehicle Trips

Development	Area	AM Peak			PM Peak		
		Arrivals	Departures	Total	Arrivals	Departures	Total
Opening Year +5 and +15							
Retail	857 sq. m	30	28	58	52	51	103
Creche	439 sq. m	11	7	18	9	10	18
Medical	147 sq. m	1	0	1	1	1	1
Office	317 sq. m	7	0	7	0	6	7
Convenience stores	431 sq. m	25	23	48	24	26	50
Community	321 sq. m	0	0	0	0	0	0
Total	2512 sq. m	73	59	132	86	93	180

Given the close proximity of the commercial/enterprise development to the residential development within the Proposed Development site, it is ideally located to facilitate a “live-work” arrangement. In order to take account of this, a 10% reduction in trips generated by the residential development has been assumed. These trips will instead be converted to sustainable walking/cycling trips between the residential and commercial areas of the masterplan area.

Since, non-residential will be developed by Opening+5 year and later year scenario only no 10% internal discount trips were assumed in Opening Year design year.

Based on the above assumptions internal trip distribution and total trip generation is summarised in Table 12-39.

Table 12-39 All Vehicle Trip Generation

Development	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Opening Year				
Residential	9	30	24	12
Non-Residential	0	0	0	0
Total = 100% Residential	9	30	24	12
Opening Year + 5 and +15				
Residential	33	104	93	46
Non-Residential	73	59	86	93
Total = 90% Residential + 100% Non-Residential	103	152	170	135

12.1.5.2.7 Trip Distribution and Assignment

The trips from the Proposed Developments are assigned to the modelled network cordons on the basis of the existing traffic patterns on the local road network. The percentage trip distribution to the different model cordons is summarised in Table 12-40.

Table 12-40 Trip Distribution percentage

Zones	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Enniskerry North	31%	29%	33%	19%
Enniskerry South	18%	17%	20%	41%
Glenamuck Road to M50/M11	21%	22%	32%	17%
Ballycorus Rd	12%	14%	9%	16%
R116	17%	18%	5%	8%

Based on the above trip distribution, total trips between these model cordons and Proposed Development site are summarised in Table 12-41.

Table 12-41 Trip Distribution to all model cordons

Zones	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Opening Year				
Enniskerry North	3	9	8	3
Enniskerry South	2	5	5	2
Glenamuck Road to M50/M11	2	7	5	3
Ballycorus Rd	1	4	3	2
R116	1	5	4	2
Total	9	30	25	12
Opening Year +5 and +15				
Enniskerry North	32	45	53	40
Enniskerry South	19	26	32	23
Glenamuck Road to M50/M11	22	34	37	30
Ballycorus Rd	12	21	21	18
R116	18	27	29	24
Total	103	153	170	135

These trips were distributed to the different access junctions based on the destination of the journey as discussed below.

12.1.5.2.7.1 Trip Distribution to all access junctions

The distribution of development traffic arriving and departing between the Enniskerry Road accesses and the GDRS access has been assumed to correspond to existing traffic patterns on

the local road network and allowing for redistribution of traffic directly onto the GDRS. Analysis was carried out based on the following scenarios as outlined below.

12.1.5.2.7.2 Opening Year

For Opening Year, two scenarios were considered. In the first scenario, it was assumed that the Glenamuck Development Road Scheme (GDRS) is not available and that only the two vehicle access points along Enniskerry Road (A2 and A3) are available for development traffic to access and egress the wider transport network. In the second scenario, it's assumed that GDRS is developed. In this case, two vehicle access points along Enniskerry Road (A2 and A3) along with additional access points (A1) along GDLR are available.

For the first scenario, it is assumed that the trips will be distributed equally to both the access points (A2 and A3).

For the second scenario, the development trips were assigned to all three access points on the basis of the above percentage as shown in Table 12-42.

Table 12-42 Traffic Distribution for access points Opening Year with GDRS

Zones	A1	A2	A3
Enniskerry North	50%	25%	25%
Enniskerry South	90%	5%	5%
Glenamuck Road to M50/M11	100%	0%	0%
Ballycorus Rd	90%	5%	5%
R116	0%	50%	50%

Vehicles travelling between Enniskerry North and Access Point A1 will use new GDDR link to travel instead of travelling along Glenamuck road and Golden Ball Junction. Hence, these trips are not reflected on the Golden Ball junction. However, vehicles travelling between Access Points along Enniskerry Road (A2 and A3) and Enniskerry Road North will travel along Golden Ball Junction. All the vehicles travelling to/from M50-M11 will use Access Point A1, while all the vehicle travelling to/from R116 will be using Access Points A2&A3 along Enniskerry Road. For vehicle travelling to/from Enniskerry Road South and Ballycorus Road, 90% will use Access Point A1 while remaining will be equally distributed along Enniskerry Road (A2, A3 and A4).

Based on the above percentage, total vehicles to different model cordons are summarised in Figure 12-52 and Figure 12-53.

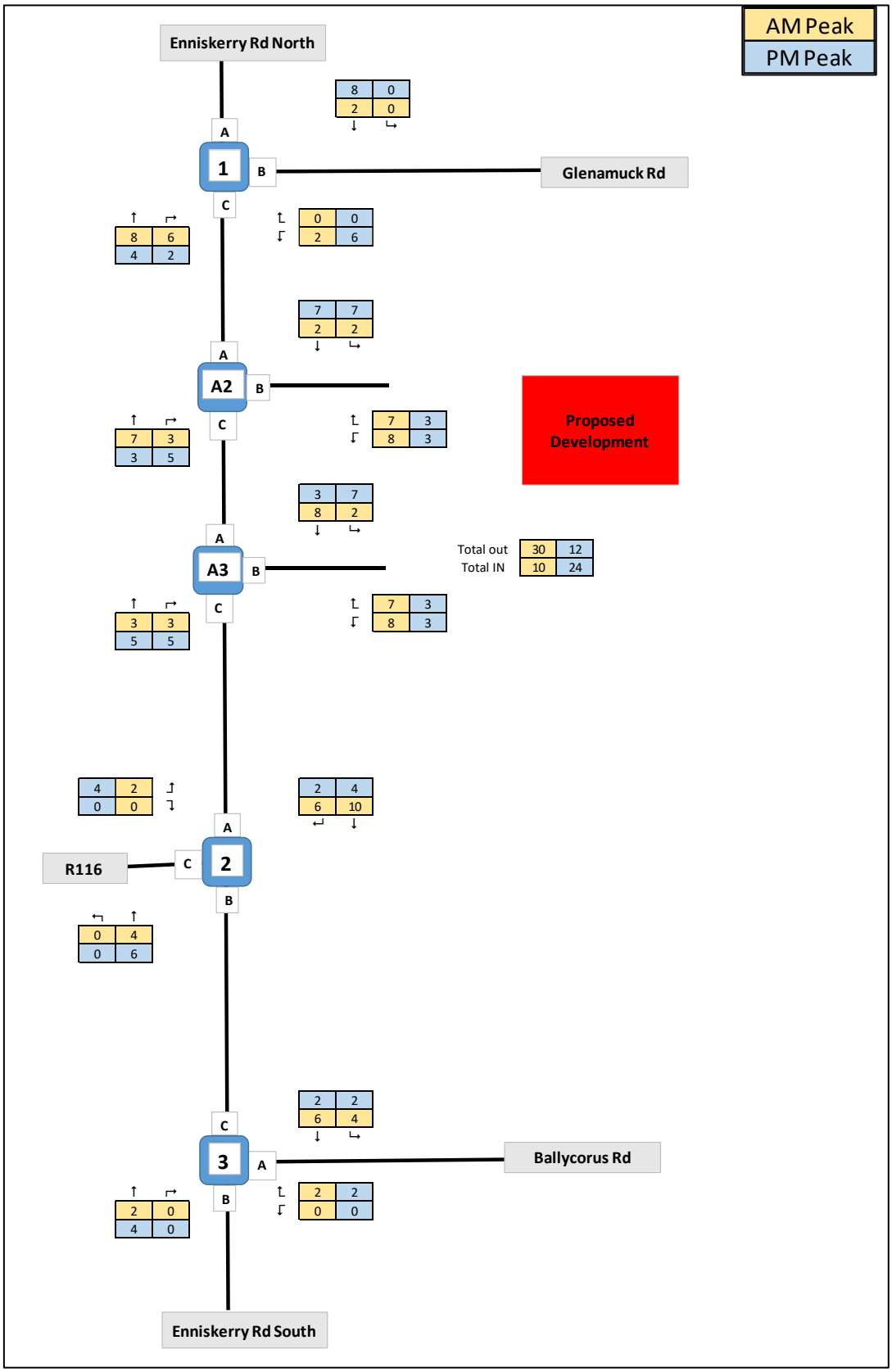

Figure 12-52 Trip Distribution Opening Year without GDRS

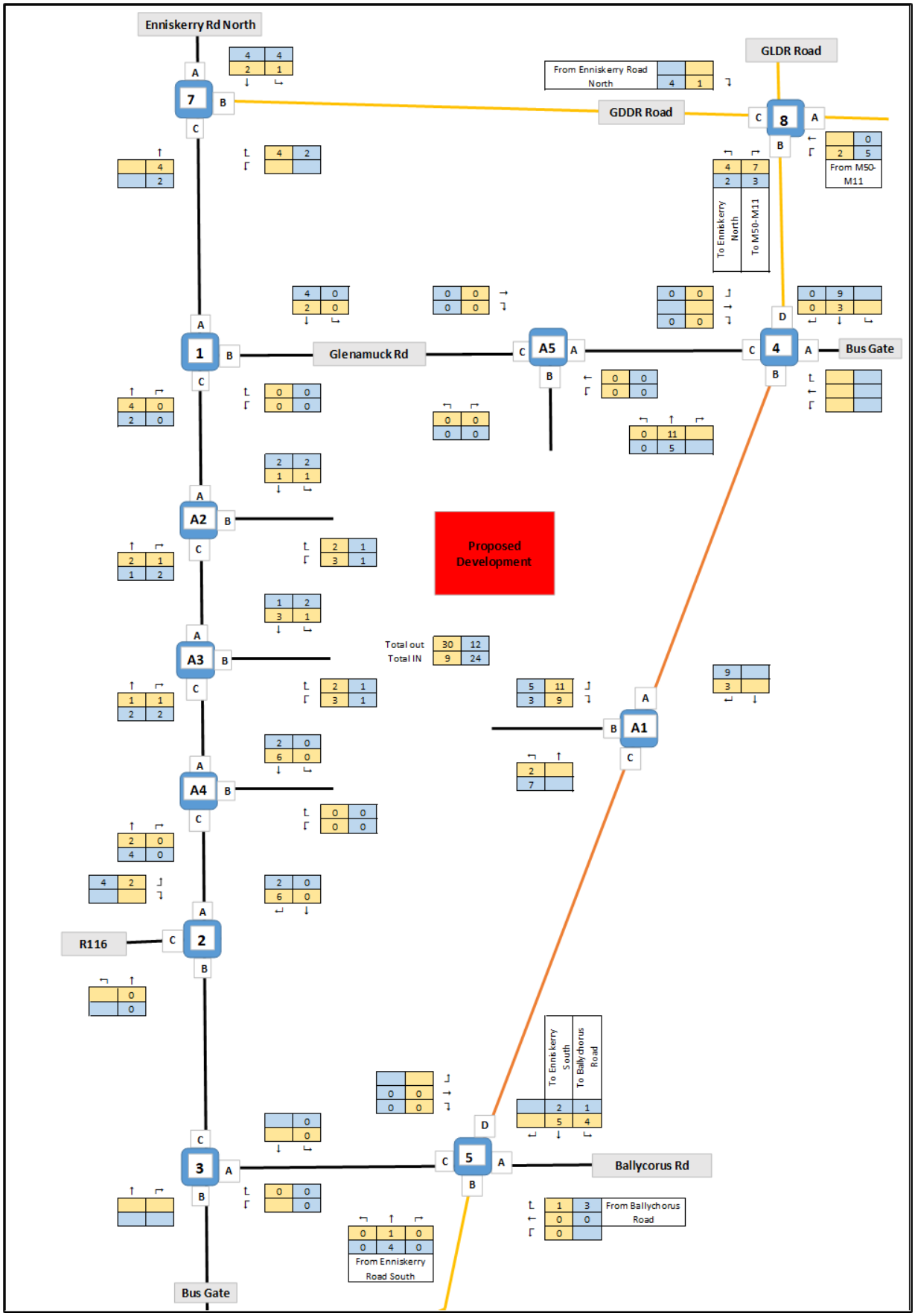

Figure 12-53 Trip Distribution Opening Year with GDRS

12.1.5.2.7.3 Opening Year +5 and +15

For these design years, it is assumed that GDRS is available and that all five access points from the development are also available to use for development traffic. Three access points (A1,A2 and A3) are same as that in the previous section. In addition, one more access point south of A2 & A3 is provided along Enniskerry Road (A4). Additional Access Pont (A5) is also provided along Glenamuck Road. The percentage of the development traffic was split based on the Percentages as shown in Table 12-43.

Table 12-43 Traffic Distribution +5 and +15 with GDRS

Zones	A1	A2	A3	A4	A5
Enniskerry North	40%	7%	7%	7%	40%
Enniskerry South	90%	3%	3%	3%	0%
Glenamuck Road to M50/M11	50%	0%	0%	0%	50%
Ballycorus Rd	90%	3%	3%	3%	0%
R116	0%	33%	33%	33%	0%

Similar to Opening year “with GDRS” scenario, vehicles travelling between Enniskerry North and Access Point A1 will use new GDR road to travel instead of travelling along Glenamuck road and Golden Ball Junction. Hence, these trips are not reflected on the Golden Ball junction. However, vehicles travelling between Access Points along Enniskerry Road (A2, A3 and A4) and Enniskerry Road North will travel along Golden Ball Junction. All the vehicles travelling to/from M50-M11 will use Access Point A1 and A5, while all the vehicle travelling to/from R116 will be using Access Points A2,A3 and A4 along Enniskerry Road. For vehicle travelling to/from Enniskerry Road South and Ballycorus Road, majority (90%) will use Access Point A1 while remaining will be equally distributed among access points along Enniskerry Road (A2, A3 and A4).

Based on the above percentage, the development trips assigned to all the access points are summarised in Figure 12-54.

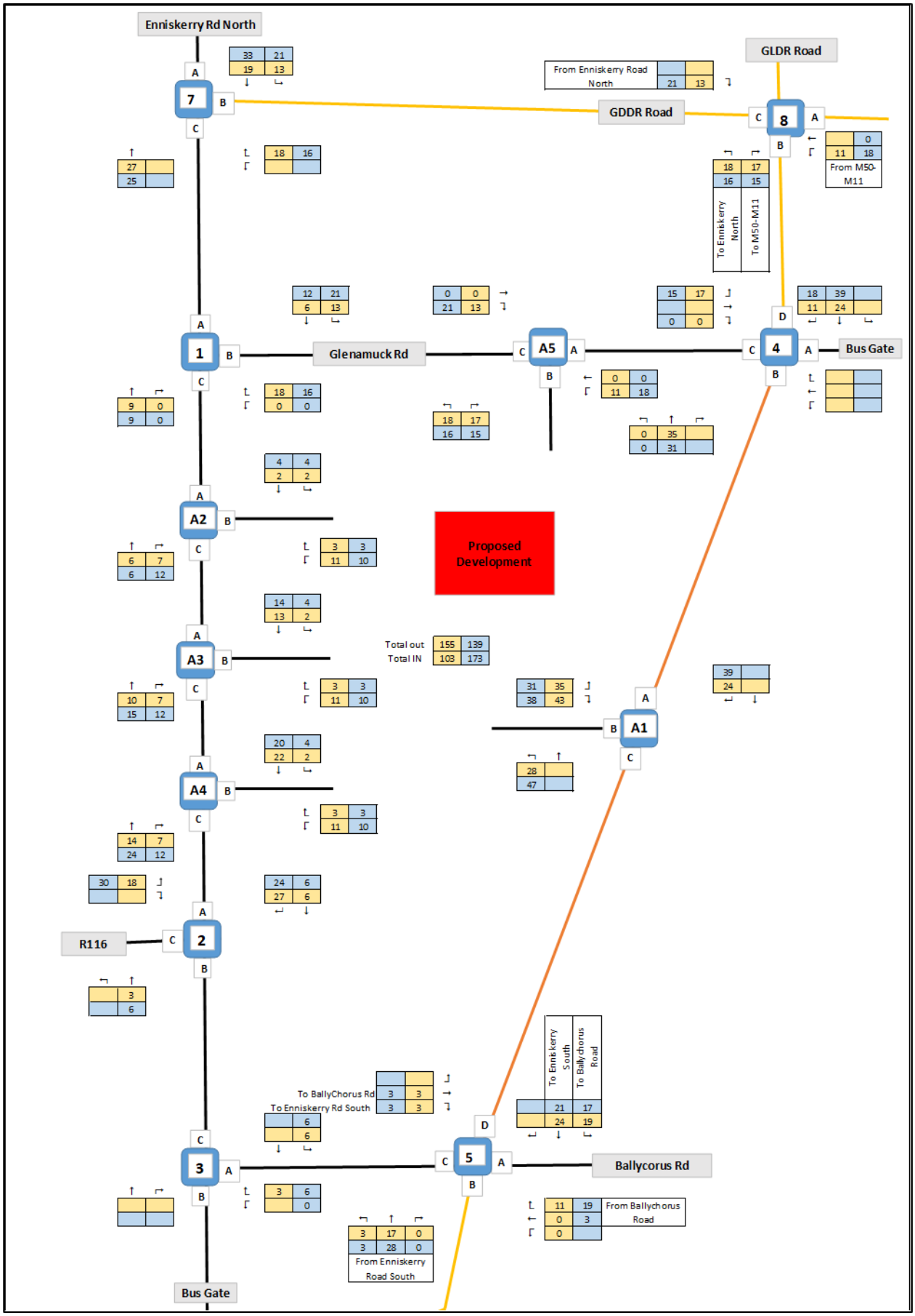

Figure 12-54 Trip Distribution with GDRS

12.1.5.2.8 Committed Development

For all the committed developments discussed in the previous section, trips for the peak hours were obtained from the respective planning applications. These trips are summarised in the figures below for "without GDRS" and "with GDRS". For "with GDRS" scenarios, all the trips to/from Enniskerry South and Ballycorus Road are diverted onto new roads except for Site 5: ABP30704320. Since, this development is located between Enniskerry Road/Glenamuck Road and Enniskerry Road/R116, therefore all the traffic to/from these developments going south will continue to travel through Enniskerry Road/Ballycorus Road junction.

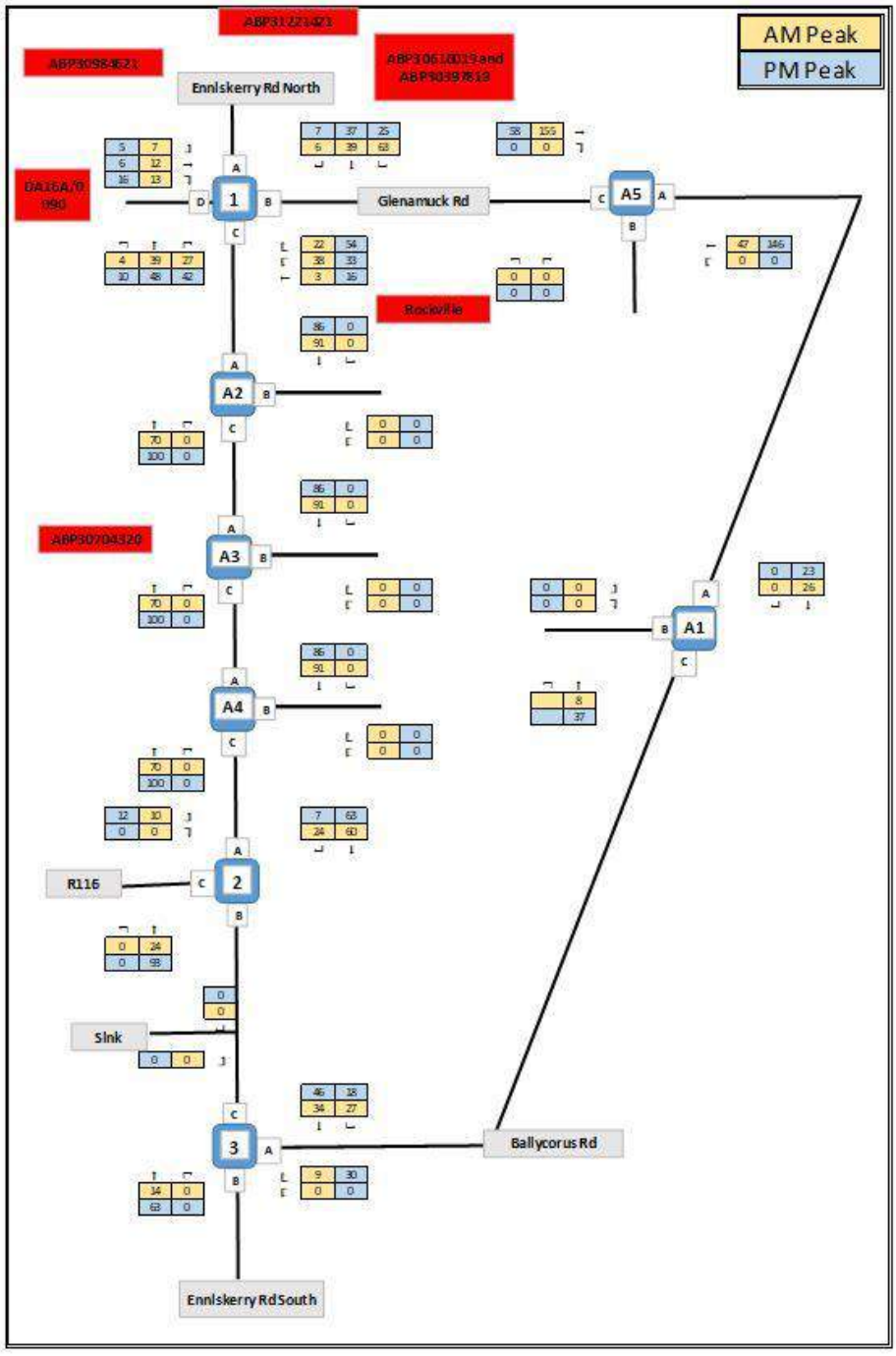

Figure 12-55 Committed Development Trips without GDRS

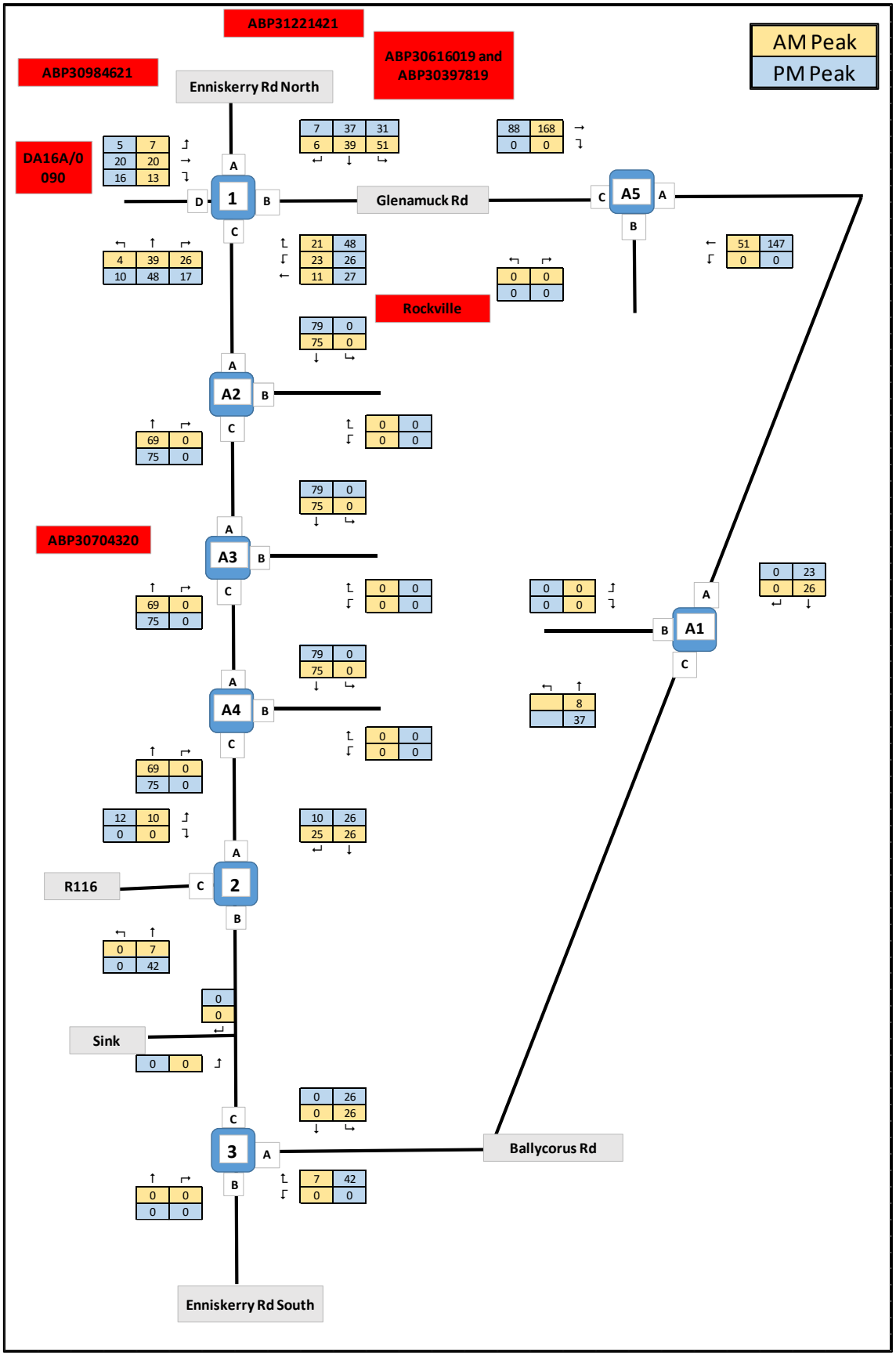

Figure 12-56 Committed Development Trips with GDRS

12.1.5.2.9 Traffic Impact Assessment and Methodology

An initial assessment was undertaken to quantify the additional traffic from the development that will be distributed onto the local road network and the potentially impacted junctions. In order to determine what level of increase is considered above threshold, reference is made to the TII Traffic and Transport Assessment Guidelines (May 2014). This document outlines the following thresholds:

- Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road; and
- Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive.

Junctions which are predicted to be impacted by an increase in traffic in excess of 5%, due to development traffic, were considered for further detailed junction assessment and modelling.

The traffic increase resulting from the Proposed Development was compared to the base year existing traffic volumes at each junction and the percentage increases are presented in the table below. The assessment was carried out in relation to the traffic generation of the proposed Kilternan Masterplan lands.

Table 12-44 Traffic Impact Opening Year

Description	Period	Without GDRS			With GDRS		
		Do Nothing Traffic	With All Development Traffic	% Increase	Do Nothing Traffic	With All Development Traffic	% Increase
Enniskerry Rd / Glenamuck Rd Junction (Golden Ball Junction)	AM	1252	1544	23%	922	1189	29%
	PM	997	1315	32%	593	892	50%
Enniskerry Rd / R116 Junction	AM	978	1119	14%	521	597	15%
	PM	795	987	24%	260	357	37%
Enniskerry Rd / Ballycorus Rd Junction	AM	592	690	17%	212	246	16%
	PM	674	840	25%	168	236	40%

As shown in Table 12-44 it can be observed that, for all the junctions the percentage increase in traffic due to all the development trips were above 10%. Therefore, in accordance with the thresholds set out in TII's Traffic and Transport Guidelines, all the junctions were brought forward for detailed assessment with all other junctions screened out of the analysis .

In addition to the assessment of the above junctions, analysis was undertaken for all the 5 access junctions.

12.1.5.2.9.1 Detailed Assessment Approach

All the above key junctions, together with all the access junctions were modelled for all the scenarios discussed in the previous sections and are also summarised again below:

- Opening Year (2024) – Background Growth + Committed Development without GDRS
- Opening Year (2024) – Background Growth + All Development without GDRS
- Opening Year (2024) – Background Growth + Committed Development with GDRS
- Opening Year (2024) – Background Growth + All Development with GDRS
- Opening Year+5 (2029) – Background Growth + Committed Development with GDRS
- Opening Year+5 (2029) – Background Growth + All Development with GDRS
- Opening Year+15 (2039) – Background Growth + Committed Development with GDRS
- Opening Year+15 (2039) – Background Growth + All Development with GDRS

For Access Junctions, only with All development scenarios are modelled for all the design year scenarios.

The junctions were analysed individually using various transport modelling software (based on the junction type) as shown in Table 12-45.

Table 12-45 Junction Modelling Software

Modelling Software	Junction Type	Sites Modelled
JCT LinSig	Traffic Signals	Golden Ball Junction, Enniskerry Road/Ballycorus Road Junction
TRL Junctions 9	Priority and Roundabout	Enniskerry Road/R116 Junction and All Access Junctions

The terminology used throughout the analysis associated with each software is explained in the following sections.

JCT LinSig

- **DOS:** This is the ratio of demand flow to capacity on a link. The saturation level is normally 90%. A degree of saturation below 90% represents a junction that is operating in an efficient and stable condition. If a link has a degree of saturation of between 90% and 100% it may still be operating to an adequate standard depending on the acceptability of queuing and delay. A degree of saturation of above 100% is considered to be over-capacity.
- **Mean Maximum Queue:** The sum of the maximum queue on a link (including uniform, random and oversaturation queues) averaged over all the cycles in the modelled time period.

- **Average Delay:** The average delay for each passenger car unit (pcu) on the lane averaged over the modelled time period.

- **Practical Reserve Capacity (PRC):** A measure of how much additional traffic could pass through the junction whilst maintaining a maximum degree of saturation of 90% on all lanes. Measured as a percentage.

TRL Junctions 9

- **RFC:** This is the ratio of demand flow to capacity. The practical capacity threshold is normally approximately 0.85. An RFC below 0.85 represents a junction which is operating in an efficient and stable condition. An RFC of between 0.85 and 1 represents variable operation, and may be said to be operating adequately, if the queueing and delay are deemed acceptable. RFC values in excess of 1 represent an oversaturated condition/

- **Queue Length:** This represents the maximum of the average queue length in pcu per time segment.

- **Average Delay**: This shows the average amount of traffic delay at the junction per vehicle over the peak hour period.
- **Level of Service (LOS) –** a qualitative measure to describe the operating conditions of a road based on factors such as peed, travel time, manoeuvrability, delay and safety LOS ranges from A to F. Where A is free flowing, and F is forced or breakdown flow

In the case of the "with GDRS" scheme scenarios, the background traffic travelling from between northern and southern part of the model cordon were reassigned to use new GDDR/GLDR links. The following assumptions were taken to estimate the redistribution of traffic:

- It is assumed that the traffic travelling from Enniskerry to the southern part of the model cordon (Enniskerry South & Ballycorus Road) will split in 1:9 ratio. That means, 10% of these trips will continue to travel straight at Golden Ball Junction and then turn left at Enniskerry Road/Ballycorus Road junction for going towards Enniskerry Road South and Ballycorus Road. For the remaining 90% trips, it was assumed that 50% will use new GDDR link while remaining will turn left at Golden Ball Junction onto Glenamuck road and then turn right onto the GLDR at proposed GDDR/GLDR junction. For the opposite direction, i.e., for vehicles travelling from the southern part of the model cordon (Enniskerry South and Ballycorus Road) towards Enniskerry Road North the same split at all the junctions are applied in the reverse order. 10% of the trips were assumed to be turning right from Ballycorus Road onto Enniskerry road and will continue straight at Golden Ball Junction. Remaining 90% will travel along GLDR. Out of them 50% will turn onto Glenamuck Road and then right onto Enniskerry Road at Golden Globe Junction. The remaining 50% will use GLDR to move to Enniskerry Road North.

- For the movement between M50-M11 and Sothern part of the model (Enniskerry Road South and Ballycorus Road), all the vehicles will be using the GLDR link rather than travelling along Enniskerry Road and Golden Ball Junction.

- It has been assumed that all the traffic from Enniskerry North and South, Ballycorus road and Glenamuck road travelling to R116/Enniskerry road junction will remain the same.

However due to bus gate installed at south of Enniskerry Road/Ballycorus Road junction, all the vehicles travelling to/from Enniskerry South was assumed to be diverted onto Ballycorus Road.

Based on the above assumptions and all the development trips discussed in the previous sections, the traffic volume at all the junctions for all the modelled scenarios are summarised in the Appendix C of the Traffic and Transport Assessment (TTA) submitted as a standalone report in support of this planning application.

12.1.5.2.10 Traffic Impact Results

As outlined in the previous section, each junction was analysed individually using the most relevant software package for that junction type.

Data collected for comparison between scenarios included:

- Queue lengths in pcus;
- Average delays in seconds; and
- Capacity (where available).

The direct output for each junction from the respective software packages are included in Appendix B of the Traffic and Transport Assessment (TTA) submitted as a standalone report in support of this planning application and are summarised in the following sections.

12.1.5.2.10.1 Enniskerry Road / Glenamuck Road Junction (Golden Ball Jct)

The junction was modelled using LinSig for all the scenarios across all the design years.

In the opening year “without GDRS” scheme, the junction was modelled as per its current layout. The stage sequence for the junction is summarised in Figure 12-57. In the first stage, both Enniskerry Road northern and southern arms were provided general green. The right turners can move into the gap when available. In the second stage, the right filter stage is provided for the southern arm with traffic from the northern arm provided red. This stage is called on demand when there are not enough gaps available for the right turners from Enniskerry Road south to move into Glenamuck Road in the first stage. As per the traffic volume, it was assumed that this stage is called every cycle for both AM and PM peak in all the scenarios. For the northern arm only 10-15 vehicles are turning right and therefore no dedicated right filter stage is required for this arm. In the third stage, both Glenamuck and Golden Pub access arm gets green. Since, traffic volume from the access arm is very low, no dedicated right filter stage was provided for any of the secondary arms. The final stage is the All Red stage in which pedestrians are provided green. Since, there are not enough pedestrian and cyclists are there in the junction. Therefore, this stage was modelled to be called once in every second cycle. The cycle time for the junction was taken as 120 seconds. Green time for the pedestrian/cyclists was based on a 5s green with an amber phase equal to the crossing width of the road divided by 1.2 m/s and a 2 s red phase before traffic regains priority.

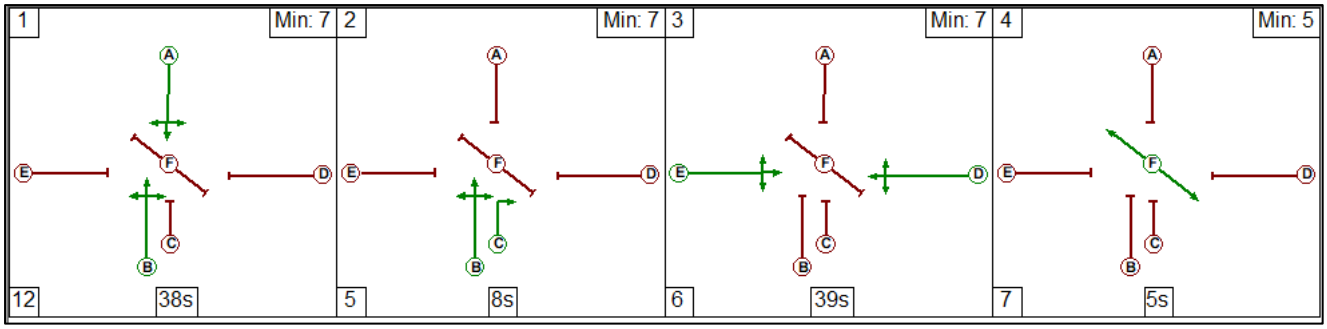

Figure 12-57 Stage Sequence for Golden Ball Jct without GDRS

For "with GDRS" scheme scenarios, the junction was modelled on the basis of the new redesign of this junction as set out in Section 12.1.3.6.2. The stage sequence for the junction is shown in Figure 12-58. The first two stages are similar to without GDRS scheme. In the first two stage, both the Enniskerry Road northern and southern arms were provided general green in which right turners can move into the gap. In the seconds stage, the dedicated right filter is provided for the southern arm with traffic from the northern arm completely stopped. Again, no dedicated right filter stage is provided for the northern arm. In the third stage, green stage is provided to the local access road. However, since the traffic volume along this arm are less. Therefore, this stage was modelled to call once in every 4 cycles. In the fourth stage, green is provided for the Glenamuck Road. The final stage is again for the pedestrian. Similar to the previous scenario, this stage was again modelled to be called once in every alternate cycle. The cycle time was taken as 120 seconds. Green time for the pedestrian/cyclists was based on a 5s green with an amber phase equal to the crossing width of the road divided by 1.2 m/s and a 2 s red phase before traffic regains priority.

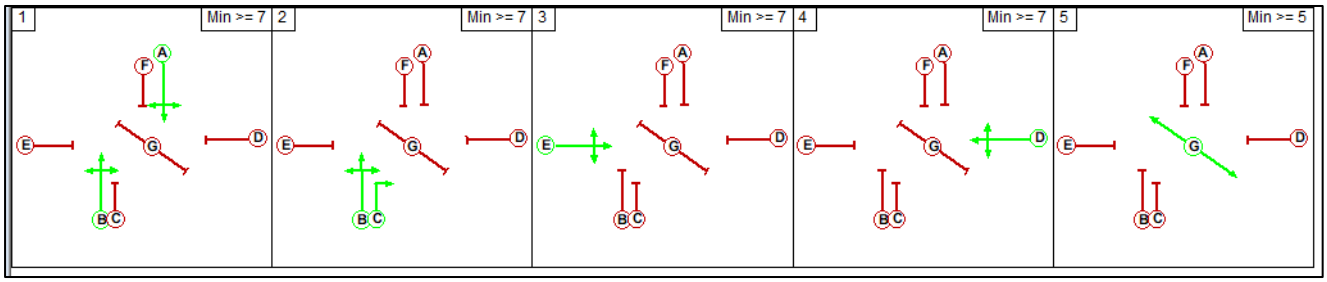

Figure 12-58 Stage Sequence for Golden Ball Jct with GDRS

The results for the Opening Year with and without GDRS schemes are shown in Table 12-46.

Table 12-46 Enniskerry / Glenamuck Road Jct - Modelling Results Opening Year

Arm	With Committed Development			With All Development		
	Mean Max Queue (pcu)	Delay (s/pcu)	DOS (%)	Mean Max Queue (pcu)	Delay (s/pcu)	DOS (%)
Opening Year without GDRS – AM Peak						
Golden Pub Access	1.0 pcu	46.4 s	17.5%	1.0 pcu	46.5 s	17.6%
Glenamuck Road	19.9 pcu	119.9 s	97.6%	20.3 pcu	123.3 s	98.1%
Enniskerry Road South	25.8 pcu	94.7 s	97.1%	26.0 pcu	91.2 s	96.7%
Enniskerry Road North	25.8 pcu	81.7 s	95.2%	28.8 pcu	99.6 s	98.1%
PRC (%)	-8.5%			-9.0%		
Opening Year without GDRS – PM Peak						
Golden Pub Access	1.0 pcu	31.4 s	13.0%	1.0 pcu	32.6 s	14.0%
Glenamuck Road	15.6 pcu	49.0 s	79.1%	16.4 pcu	52.5 s	82.0%
Enniskerry Road South	13.2 pcu	57.3 s	78.8%	13.8 pcu	59.4 s	81.6%
Enniskerry Road North	14.5 pcu	52.2 s	76.4%	12.6 pcu	38.1 s	62.3%
PRC (%)	13.7%			9.8%		
Opening Year with GDRS – AM Peak						
Golden Pub Access	1.6 pcu	76.8 s	35.9%	1.6 pcu	76.8 s	35.9%
Glenamuck Road	10.6 pcu	50.1 s	67.5%	10.6 pcu	50.1 s	67.5%
Enniskerry Road South	3.4 pcu	24.8 s	36.3%	3.4 pcu	24.8 s	36.5%
Enniskerry Road North	14.6 pcu	35.6 s	68.5%	14.6 pcu	35.7 s	68.7%
PRC (%)	31.4%			31.0%		
Opening Year with GDRS – PM Peak						
Golden Pub Access	2.2 pcu	81.0 s	45.5%	2.2 pcu	81.0 s	45.5%
Glenamuck Road	9.1 pcu	38.8 s	53.1%	9.1 pcu	40.0 s	54.5%
Enniskerry Road South	2.1 pcu	22.8 s	17.4%	2.1 pcu	22.1 s	17.2%
Enniskerry Road North	9.5 pcu	36.1 s	54.2%	9.5 pcu	35.2 s	53.6%
PRC (%)	66.0%			65.3%		

As shown in Table 12-46 it can be observed that the junction is operating over the capacity in the scenario "without GDRS" during the morning peak. However, this is mostly due to the background growth and trips associated with the committed developments. The impact of the additional trips due to the Proposed Development is very small with PRC deteriorating from -8.5% in the with committed development AM Peak scenario to -9.0% in the corresponding All Development scenario (i.e., a 0.5% impact). In addition, the maximum average delay was around 2 min, which is typical for an urbanised signalised junction. For the "without GDRS" PM Peak scenario, the junction was found to be operating within the capacity for both "Committed Development" and "All Development Scenario". The impact of the Proposed Development trips was small with PRC for both the scenarios being observed as 13.7% and 9.8% respectively.

For the "with GDRS" scenarios, the junction was found to be operating within the capacity across all the scenarios during both AM and PM peak. The impact of the additional trips due to the

Proposed Development is very small with PRC reducing from 31.4% in the with committed development AM Peak scenario to 31.0% in the corresponding All Development scenario (i.e., a 0.4% impact). For the PM Peak, the PRC was observed to be reduced by small amount of 0.7%, from 66.0% in "Committed Development" scenario to 65.3% in "All Development" scenario.

Overall, the junction was found to be operating over the capacity in "Without GDRS" AM Peak scenario and for all other scenarios, the junction was found to be within the capacity. The impact of the development trips was observed to be very small.

The result of the Opening Year +5 and +15 are summarised in Table 14-47. In both design years, only "with GRDS" scheme scenarios are modelled.

Table 12-47 Glenamuck / Enniskerry Road _ +5 and +15 model outputs

Arm	With Committed Development			With All Development		
	Mean Max Queue (pcu)	Delay (s/pcu)	DOS (%)	Mean Max Queue (pcu)	Delay (s/pcu)	DOS (%)
Opening Year + 5 with GDRS – AM Peak						
Golden Pub Access	1.6 pcu	76.8 s	35.9%	1.6 pcu	76.8 s	35.9%
Glenamuck Road	11.2 pcu	51.2 s	69.8%	12.1 pcu	53.3 s	73.5%
Enniskerry Road South	3.6 pcu	25.7 s	38.7%	3.7 pcu	26.1 s	39.9%
Enniskerry Road North	15.5 pcu	36.7 s	70.9%	16.3 pcu	37.9 s	73.5%
PRC (%)	26.9%			22.5%		
Opening Year + 5 with GDRS – PM Peak						
Golden Pub Access	2.0 pcu	79.2 s	41.7%	2.0 pcu	79.2 s	41.7%
Glenamuck Road	9.3 pcu	39.3 s	54.6%	10.2 pcu	41.3 s	58.8%
Enniskerry Road South	2.2 pcu	23.1 s	18.3%	2.4 pcu	22.8 s	19.0%
Enniskerry Road North	9.9 pcu	36.6 s	56.0%	11.0 pcu	37.0 s	59.9%
PRC (%)	60.7%			50.4%		
Opening Year + 15 with GDRS – AM Peak						
Golden Pub Access	1.6 pcu	76.8 s	35.9%	1.6 pcu	76.8 s	35.9%
Glenamuck Road	12.4 pcu	54.2 s	74.8%	13.3 pcu	56.9 s	35.9%
Enniskerry Road South	4.1 pcu	27.7 s	44.0%	4.2 pcu	28.2 s	45.3%
Enniskerry Road North	17.2 pcu	39.1 s	75.7%	18.1 pcu	40.7 s	78.3%
PRC (%)	19.0%			14.7%		
Opening Year + 15 with GDRS – PM Peak						
Golden Pub Access	2.0 pcu	79.2 s	41.7%	2.0 pcu	79.2 s	41.7%
Glenamuck Road	10.2 pcu	41.4 s	59.2%	10.9 pcu	42.3 s	61.9%
Enniskerry Road South	2.2 pcu	23.1 s	19.5%	2.4 pcu	23.5 s	20.5%
Enniskerry Road North	10.6 pcu	36.6 s	58.4%	11.9 pcu	38.2 s	63.4%
PRC (%)	52.2%			41.9%		

For the Opening+5 AM Peak scenario, the PRC reduced from 26.9% in "Committed Development" scenario to 22.5% in "All Development" scenario. The maximum increase in queue was observed to be in order of 1 pcu, while the maximum increase in the average delay was observed to be in order of 2 seconds. The maximum DOS for both the scenarios were observed to be in order of 70% for Committed Development scenario, while 74% for All Development scenario. This suggests that the junction was found to be operating within the capacity. The small increase in delay and queue suggests that the impact of the development trips was observed to be small.

For the Opening+5 PM Peak scenario, the PRC reduced from 60.7% in "Committed Development" scenario to 50.4% in "All Development" scenario. The maximum increase in queue was observed

to be in order of 1 pcu, while the maximum increase in the average delay was observed to be in order of 2 seconds. The maximum DOS for both the scenarios were observed to be in order of 56% for Committed Development scenario, while 60% for All Development scenario. This suggests that the junction was found to be operating within the capacity. The small increase in delay and queue again suggests that the impact of the development trips was small.

For the Opening+15 AM Peak scenario, the PRC reduced from 19.0% in "Committed Development" scenario to 14.7% in "All Development" scenario. The maximum increase in queue was observed to be in order of 1 pcu, while the maximum increase in the average delay was observed to be in order of 3 seconds. The maximum DOS for both the scenarios were observed to be in order of 76% for Committed Development scenario, while 77% for All Development scenario. This suggests that the junction was found to be operating within the capacity. The small increase in delay and queue suggests that the impact of the development trips was observed to be small.

For the Opening+5 PM Peak scenario, the PRC reduced from 52.2% in "Committed Development" scenario to 41.9% in "All Development" scenario. The maximum increase in queue was observed to be in order of 1 pcu, while the maximum increase in the average delay was observed to be in order of 2 seconds. The maximum DOS for both the scenarios were observed to be in order of 59% for Committed Development scenario, while 63% for All Development scenario. This suggests that the junction was found to be operating within the capacity. The small increase in delay and queue again suggests that the impact of the development trips was small.

Overall, the junction was found to be operating within capacity across all the junctions. The impact of the additional development trips was observed to be small for both +5 and +15 design years scenarios during both AM and PM Peak.

12.1.5.2.10.2 Enniskerry Road / R116 Junction

For all the design year scenarios, the junction was modelled in its current configuration as a priority junction as shown in Section 12.1.3.4. The junction has been modelled in Junction 9 (PICADY).

The opening year model results are shown in Table 12-48.

Table 12-48 Enniskerry Rd/ R116 Jct Model outputs Opening Year

Arm	With Committed Development				With All Development			
	Queue	Delay	RFC	LOS	Queue	Delay	RFC	LOS
Opening Year without GDRS – AM Peak								
R116 Left	0.4 pcu	8.41 s	0.30	A	0.4 pcu	8.47 s	0.30	A
R116 Right	0.2 pcu	15.15 s	0.17	C	0.2 pcu	15.39 s	0.17	C
Enniskerry Road North	1.3 pcu	8.22 s	0.47	A	1.4 pcu	8.48 s	0.49	A
Opening Year without GDRS – PM Peak								
R116 Left	0.1 pcu	6.86 s	0.10	A	0.1 pcu	6.86 s	0.10	A
R116 Right	0.1 pcu	12.34 s	0.12	B	0.1 pcu	12.60 s	0.12	B
Enniskerry Road North	0.5 pcu	4.95 s	0.19	A	0.5 pcu	4.96 s	0.19	A

Opening Year with GDRS – AM Peak								
R116 Left	0.4 pcu	7.28 s	0.27	A	0.4 pcu	7.31 s	0.27	A
R116 Right	0.2 pcu	11.50 s	0.13	B	0.2 pcu	11.57 s	0.13	B
Enniskerry Road North	0.6 pcu	8.23 s	0.35	A	0.6 pcu	8.38 s	0.36	A
Opening Year with GDRS – PM Peak								
R116 Left	0.1 pcu	6.20 s	0.09	A	0.1 pcu	6.18 s	0.09	A
R116 Right	0.1 pcu	9.36 s	0.09	A	0.1 pcu	9.49 s	0.09	A
Enniskerry Road North	0.2 pcu	6.37 s	0.13	A	0.2 pcu	6.40 s	0.14	A

For Opening Year AM Peak “without GDRS” scenario, the LOS was observed to be C for both Committed Development and All Development scenario. The maximum RFC was observed to be 0.47 and 0.49 respectively for both the scenarios. This suggests that the junction was found to be operating just at the capacity for both the scenarios. However, it’s mostly due to background growth and committed development. The impact of the development trips was observed to be very small with maximum increase in RFC was observed to be 0.02, while the maximum increase in average queue was observed to be 0.1 pcu and maximum increase in average delay was 0.26 second.

For Opening Year PM Peak “without GDRS” scenario, the LOS was observed to be B for both Committed Development and All Development scenario. The maximum RFC was observed to be 0.19 for both the scenarios. This suggests that the junction was found to be operating within the capacity for both the scenarios. The impact of the development trips was observed to be very no change RFC being observed, while the maximum increase in average queue was observed to be 0.1 pcu and maximum increase in average delay was 0.26 second.

For Opening Year AM Peak “with GDRS” scenario, the LOS was observed to be B for both Committed Development and All Development scenario. The maximum RFC was observed to be 0.35 and 0.36 respectively for both the scenarios. This suggests that the junction was found to be operating within the capacity for both the scenarios. The impact of the development trips was observed to be negligible with maximum increase in RFC was observed to be 0.01, while the maximum increase in average queue was observed to be 0 pcu and maximum increase in average delay was 0.15 second

For Opening Year PM Peak “with GDRS” scenario, the LOS was observed to be A for both Committed Development and All Development scenario. The maximum RFC was observed to be 0.13 and 0.14 respectively for both the scenarios. This suggests that the junction was found to be operating within the capacity for both the scenarios. The impact of the Proposed Development trips was observed to be negligible with maximum increase in RFC was observed to be 0.01, while the maximum increase in average queue was observed to be 0 pcu and maximum increase in average delay was 0.13 second.

Overall, the junction was found to be operating just at the capacity in Opening year “without GDRS” AM Peak scenario with LOS C. However, it is due to background growth and committed development trips. The impact of the Proposed Development trips was very small. For the remaining scenarios, the junction was operating within the capacity with the impact of the Proposed Development trips being negligible to very small.

The opening year +5 and +15 modelled outputs are shown in Table 12-49.

Table 12-49 Enniskerry Rd / R116- Modelling results: Opening Year+5 and +15

Arm	With Committed Development				With All Development			
	Queue	Delay	RFC	LOS	Queue	Delay	RFC	LOS
Opening Year + 5 with GDRS – AM Peak								
R116 Left	0.4 pcu	7.39 s	0.28	A	0.5 pcu	8.06 s	0.32	A
R116 Right	0.2 pcu	11.64 s	0.14	B	0.2 pcu	12.10 s	0.14	B
Enniskerry Road North	0.6 pcu	8.38 s	0.37	A	0.8 pcu	9.11 s	0.42	A
Opening Year + 5 with GDRS – PM Peak								
R116 Left	0.1 pcu	6.23 s	0.09	A	0.2 pcu	6.36 s	0.14	A
R116 Right	0.1 pcu	9.40 s	0.09	A	0.1 pcu	10.10 s	0.10	A
Enniskerry Road North	0.2 pcu	6.39 s	0.14	A	0.3 pcu	6.73 s	0.18	A
Opening Year + 15 with GDRS – AM Peak								
R116 Left	0.4 pcu	7.71 s	0.30	A	0.5 pcu	8.03 s	0.33	A
R116 Right	0.2 pcu	12.05 s	0.15	B	0.2 pcu	12.53 s	0.16	B
Enniskerry Road North	0.7 pcu	8.76 s	0.40	A	0.9 pcu	9.58 s	0.45	A
Opening Year + 15 with GDRS – PM Peak								
R116 Left	0.1 pcu	6.32 s	0.10	A	0.2 pcu	6.46 s	0.15	A
R116 Right	0.1 pcu	9.56 s	0.10	A	0.1 pcu	10.26 s	0.11	A
Enniskerry Road North	0.2 pcu	6.46 s	0.15	A	0.3 pcu	6.81 s	0.20	A

For Opening Year+5 AM Peak “with GDRS” scenario, the LOS was observed to be B for both Committed Development and All Development scenario. The maximum RFC was observed to be 0.37 and 0.42 respectively for both the scenarios. This suggests that the junction was found to be operating within the capacity for both the scenarios. The impact of the development trips was observed to be very small with maximum increase in RFC was observed to be 0.05, while the maximum increase in average queue was observed to be 0.2 pcu and maximum increase in average delay was 0.73 second.

For Opening Year+5 PM Peak “with GDRS” scenario, the LOS was observed to be A for both Committed Development and All Development scenario. The maximum RFC was observed to be 0.14 and 0.18 respectively for both the scenarios. This suggests that the junction was found to be operating within the capacity for both the scenarios. The impact of the development trips was observed to be very small with maximum increase in RFC was observed to be 0.05, while the maximum increase in average queue was observed to be 0.1 pcu and maximum increase in average delay was 0.70 second.

For Opening Year+15 AM Peak “with GDRS” scenario, the LOS was observed to be B for both Committed Development and All Development scenario. The maximum RFC was observed to be 0.40 and 0.45 respectively for both the scenarios. This suggests that the junction was found to be operating within the capacity for both the scenarios. The impact of the development trips was

observed to be negligible with maximum increase in RFC was observed to be 0.05, while the maximum increase in average queue was observed to be 0.2 pcu and maximum increase in average delay was 0.82 second.

For Opening Year+15 PM Peak "with GDRS" scenario, the LOS was observed to be A for both Committed Development and All Development scenario. The maximum RFC was observed to be 0.15 and 0.20 respectively for both the scenarios. This suggests that the junction was found to be operating within the capacity for both the scenarios. The impact of the development trips was observed to be negligible with maximum increase in RFC was observed to be 0.05, while the maximum increase in average queue was observed to be 0.1 pcu and maximum increase in average delay was 0.70 second.

Overall, the junction was found to be operating within the capacity for all the scenarios with the impact of the Proposed Development trips being very small.

12.1.5.2.10.3 Enniskerry / Ballycorus Road Jct

The junction was only modelled for Opening Year "without GDRS" scenario. This is because, in with GDRS scenarios due to installation of the Bus gate at the downstream of this junction, there will be negligible vehicles will be accessing the southern arm. Therefore, the significant movement will be from Enniskerry North to Ballycorus road and from vice-versa. There is no conflict between these movements and hence, requires no modelling.

The junction was modelled using LinSig and was modelled as per its current layout as a signalised junction as shown in Section 3.5.3. The stage sequence for the junction is summarised in Figure 12-59.

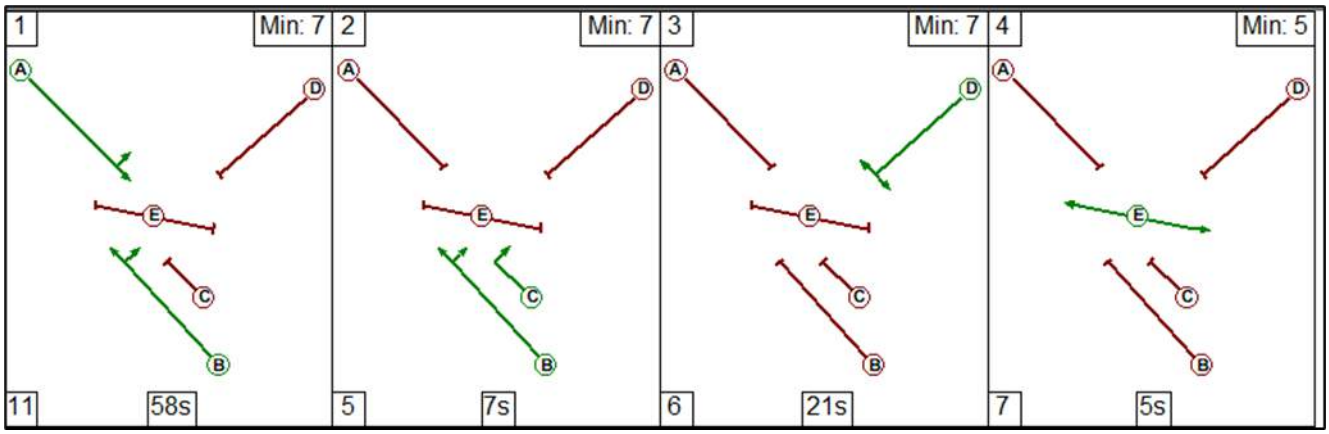

Figure 12-59 Stage Sequence Enniskerry / Ballycorus Rd Jct without GDRS

In the first stage, both Enniskerry Road arms are given general green with right turners being allowed to turn into the gap. The second stage is the right turning filter stage for the Enniskerry southern arm where right turners get priority, and the northern arm is provided red. This stage is called on demand if there are no sufficient gaps available for right turners in the first stage. Since, there are not many right turners at this junction, therefore, this stage is modelled to be called once in every two cycles. In the third stage, Ballycorus road is provided green. The final stage is all red stage where pedestrian/cyclists are provided green. This stage is also modelled to be called once in every two cycles. The cycle time was taken as 120 seconds. Green time for the

pedestrian/cyclists was based on a 5s green with an amber phase equal to the crossing width of the road divided by 1.2 m/s and a 2 s red phase before traffic regains priority. The model outputs are shown in Table 12-50.

Table 12-50 Enniskerry Rd / Ballycorus Rd modelling results

Arm	With Committed Development			With All Development		
	Mean Max Queue (pcu)	Delay (s/pcu)	DOS (%)	Mean Max Queue (pcu)	Delay (s/pcu)	DOS (%)
Opening Year without GDRS – AM Peak						
Enniskerry Road South	3.5 pcu	12.9 s	20.4%	3.4 pcu	12.5 s	20.4%
Enniskerry Road North	6.2 pcu	16.2 s	31.7%	6.3 pcu	15.7 s	32.1%
Ballycorus Road	4.0 pcu	43.8 s	30.6%	4.1 pcu	45.1 s	32.2%
PRC (%)	184.2%			179.4%		
Opening Year without GDRS – PM Peak						
Enniskerry Road South	3.8 pcu	10.5 s	22.2%	3.8 pcu	10.6 s	22.6%
Enniskerry Road North	8.1 pcu	13.2 s	39.6%	8.1 pcu	13.3 s	39.9%
Ballycorus Road	3.8 pcu	53.6 s	37.9%	3.9 pcu	53.7 s	38.5%
PRC (%)	127.5%			125.6%		

Across all the scenarios, the junction was found to be well within the capacity. The modelling outputs shown that in both the AM and PM peak periods this junction experiences very small changes in queue lengths, delay and degree of saturation. One of the reasons for this is that development traffic outputs are anticipated to predominately travel north in the AM towards Dublin thus largely avoiding this junction.

In the future year scenarios (+5 and +15) the operation of the GDRS results in a bus gate in place on Enniskerry Road south that results in very limited traffic heading from Enniskerry South to Enniskerry North (i.e., buses only). As a result of this reduced flow there is an opportunity to redesign this junction from a signalised junction to a priority junction with traffic heading from Enniskerry South giving way to movements to and from Ballycorus and Enniskerry Road North.

12.1.5.2.10.4 Access Junctions

All the Access junctions were modelled using TRL Junction 9 software. All the junctions were only modelled for “All Development” scenario, not for Committed Development scenario, since no vehicles will be using the access junctions for travelling to/from the Proposed Development in this scenario and therefore, there will be no conflict and the junction will have infinite capacity.

12.1.5.2.10.5 Access Junction A1

Junction A1 refers internal road / GLDR junction located to the east of the site as set out in Section 5.5. This junction is not available in the opening year without GDRS scenario. Therefore, modelling outputs are provided for with GDRS scenarios only. The results are shown in Table 12-51.

Table 12-51 Development Access Junction A1 Modelling results

Arm	AM Peak				PM Peak			
	Queue	Delay	RFC	LOS	Queue	Delay	RFC	LOS
Opening Year with GDRS								
Access Arm Left	0.0 pcu	6.28 s	0.02	A	0.0 pcu	5.85 s	0.01	A
Access Arm Right	0.0 pcu	9.65 s	0.03	A	0.0 pcu	10.37 s	0.01	A
GLDR North	0.0 pcu	5.23 s	0.01	A	0.0 pcu	4.78 s	0.02	A
Opening Year+5 with GDRS								
Access Arm Left	0.1 pcu	7.29 s	0.07	A	0.1 pcu	7.12 s	0.06	A
Access Arm Right	0.1 pcu	10.42 s	0.12	B	0.1 pcu	10.93 s	0.11	B
GLDR North	0.1 pcu	5.41 s	0.06	A	0.2 pcu	5.03 s	0.11	A
Opening Year+15 with GDRS								
Access Arm Left	0.1 pcu	7.37 s	0.07	A	0.1 pcu	7.18 s	0.06	A
Access Arm Right	0.1 pcu	10.67 s	0.12	B	0.1 pcu	11.22 s	0.12	B
GLDR North	0.1 pcu	5.36 s	0.06	A	0.2 pcu	4.95 s	0.11	A

The maximum average delay across all the design years is observed to be under 12 seconds and maximum average queue was 0.2 pcu. The maximum RFC was 0.12 across all the scenarios. The LOS was recorded as A for both peak hours during Opening Year and was observed to be B for both peak hours for both Opening+5 and Opening+15 design years scenarios. Therefore, the above results suggest that the junction will be operating within capacity for all the design years.

The modelling outputs shows that this junction will perform within acceptable parameters with negligible impact on the main flows along the GLDR. The model results indicate that the design of this junction as priority junction arrangement as opposed to a signal junction is appropriate and correct for the level demand.

12.1.5.2.10.6 Access Junction A2

Junction 2 refers internal road north/ Enniskerry Road junction located at the north-west part of the site as set out in Section 5.5. This junction is available in all the modelled scenarios (with and without GDRS) across all the design years. Modelling results are shown inTable 12-52 .

Table 12-52 Development Access Junction A2 Modelling results

Arm	AM Peak				PM Peak			
	Queue	Delay	RFC	LOS	Queue	Delay	RFC	LOS
Access Arm	0.1 pcu	11.49 s	0.05	B	0.0 pcu	10.71 s	0.02	B
Enniskerry Road South	0.0 pcu	4.54 s	0.01	A	0.0 pcu	5.23 s	0.02	A
Opening Year with GDRS								
Access Arm	0.0 pcu	8.55 s	0.01	A	0.0 pcu	0.00 s	0.00	A
Enniskerry Road South	0.0 pcu	5.09 s	0.00	A	0.0 pcu	5.56 s	0.00	A
Opening Year+5 with GDRS								
Access Arm	0.0 pcu	8.14 s	0.03	A	0.0 pcu	7.50 s	0.03	A
Enniskerry Road South	0.0 pcu	5.10 s	0.02	A	0.0 pcu	5.62 s	0.03	A
Opening Year+15 with GDRS								
Access Arm	0.0 pcu	8.25 s	0.03	A	0.0 pcu	7.54 s	0.03	A
Enniskerry Road South	0.0 pcu	5.05 s	0.02	A	0.0 pcu	5.61 s	0.03	A

The LOS is B for without GLDR scenario because no additional access points along GLDR is available in this scenario. Therefore, all the vehicles will be using the access points along Enniskerry Road (A2 and A3). However, average queue, delay and RFC are small suggesting that the junction is operating within the capacity.

For with GDRS scenarios, the LOS was observed to be A. It is mainly because, vehicles going towards R116 will mostly be using this access point. Very few vehicles moving towards Enniskerry Road North and south may be using this junction. Most of the vehicles going north and south will be using Access Points A1 along GLDR in Opening Year. For Opening+5 and+15, most of the vehicles going north will be using Access Points A1 (along GLDR) and A5 (along Glenamuck Road), and for vehicles going south will be using A1 along GLDR.

The model results indicate that the design of this junction as priority junction arrangement (as opposed to a signal junction) is appropriate and correct.

12.1.5.2.10.7 Access Junction A3

Junction 3 refers internal road / Enniskerry Road junction located centrally on the Enniskerry Road frontage as set out in Section 5.5. This junction is available in all the modelled scenarios (with and without GDRS) across all the design years. Modelling results are shown in *Table 12-53.*

Table 12-53 Development Access Junction A3 Modelling results

Arm	AM Peak				PM Peak			
	Queue	Delay	RFC	LOS	Queue	Delay	RFC	LOS
Opening Year without GDRS								
Access Arm	0.1 pcu	11.53 s	0.05	B	0.0 pcu	10.69 s	0.02	B
Enniskerry Road South	0.0 pcu	4.55 s	0.01	A	0.0 pcu	5.22 s	0.02	A
Opening Year with GDRS								
Access Arm	0.0 pcu	8.55 s	0.01	A	0.0 pcu	0.00 s	0.00	A
Enniskerry Road South	0.0 pcu	5.09 s	0.00	A	0.0 pcu	5.56 s	0.00	A
Opening Year+5 with GDRS								
Access Arm	0.0 pcu	8.19 s	0.03	A	0.0 pcu	7.54 s	0.03	A
Enniskerry Road South	0.0 pcu	5.10 s	0.02	A	0.0 pcu	5.59 s	0.03	A
Opening Year+15 with GDRS								
Access Arm	0.0 pcu	8.31 s	0.03	A	0.0 pcu	7.59 s	0.03	A
Enniskerry Road South	0.0 pcu	5.05 s	0.02	A	0.0 pcu	5.58 s	0.03	A

The LOS is B for without GLDR scenario because no additional access points along GLDR is available in this scenario. Therefore, all the vehicles will be using the access points along Enniskerry Road (A2 and A3). However, average queue, delay and RFC are small suggesting that the junction is operating within the capacity.

For with GDRS scenarios, the LOS was observed to be A. It is mainly because, vehicles going towards R116 will mostly be using this access point. Very few vehicles moving towards Enniskerry Road North and south may be using this junction. Most of the vehicles going north and south will be using Access Points A1 along GLDR in Opening Year. For Opening+5 and+15, most of the vehicles going north will be using Access Points A1 (along GLDR) and A5 (along Glenamuck Road), and for vehicles going south will be using A1 along GLDR.

The model results indicate that the design of this junction as priority junction arrangement (as opposed to a signal junction) is appropriate and correct.

12.1.5.2.10.8 Access Junction A4

Junction 4 refers internal road south / Enniskerry Road junction located to the southern end of the site on the Enniskerry Road frontage as set out in Section 5.5. This junction is not available in the opening year and only becomes operational in the modelled scenarios (i.e., +5 and +15). Modelling results are shown in Table 12-54 .

Table 12-54 Development Access Junction A4 Modelling results

Arm	AM Peak				PM Peak			
	Queue	Delay	RFC	LOS	Queue	Delay	RFC	LOS
Opening Year+5 with GDRS								
Access Arm	0.0 pcu	8.24 s	0.03	A	0.0 pcu	7.57 s	0.03	A
Enniskerry Road South	0.0 pcu	5.10 s	0.02	A	0.0 pcu	5.56 s	0.03	A
Opening Year+15 with GDRS								
Access Arm	0.0 pcu	8.36 s	0.03	A	0.0 pcu	7.62 s	0.03	A
Enniskerry Road South	0.0 pcu	5.04 s	0.02	A	0.0 pcu	5.55 s	0.03	A

The junction was found to be operating within capacity for all the design years across both peak hours. It is mainly because, vehicles going towards R116 will mostly be using this access point. Very few vehicles moving towards Enniskerry Road North and south may be using this junction. Most of the vehicles going north will be using Access Points A1 (along GLDR) and A5 (along Glenamuck Road), and for vehicles going south will be using A1 along GLDR.

The model results indicate that the design of this junction as priority junction arrangement (as opposed to a signal junction) is appropriate and correct.

12.1.5.2.10.9 Access Junction A5

Junction 5 refers to internal road north / Glenamuck Road junction located to the northern frontage of the site. This junction is not available in the opening year and only becomes operational in the modelled scenarios (i.e., +5 and +15). Modelling results are shown in Table 12-55.

Table 12-55 Development Access Junction A5 Modelling results

Arm	AM Peak				PM Peak			
	Queue	Delay	RFC	LOS	Queue	Delay	RFC	LOS
Opening Year+5 with GDRS								
Access Arm	0.1 pcu	9.36 s	0.09	A	0.1 pcu	9.01 s	0.08	A
Glenamuck road Eastbound	0.1 pcu	4.47 s	0.04	A	0.1 pcu	5.21 s	0.06	A
Opening Year+15 with GDRS								
Access Arm	0.1 pcu	9.61 s	0.09	A	0.1 pcu	9.11 s	0.08	A
Glenamuck road Eastbound	0.1 pcu	4.41 s	0.04	A	0.1 pcu	5.18 s	0.06	A

The Junction will be used by the vehicles moving toward Enniskerry Road North and Glenamuck Road for going to/from M50-M11 motorway. Across all the scenarios, the maximum average queue was observed to be 0.1 pcu, with maximum average delay observed was under 10 seconds and maximum RFC was 0.009. The LOS was A across all the scenarios, suggesting that the junction was found to be operating well within the capacity across all the design year scenarios for both peaks.

The model results indicate that the design of this junction as priority junction arrangement (as opposed to a signal junction) is appropriate and correct.

12.1.5.2.10.10 Junction Impact Conclusion

The modelling was carried out for all the key junctions along Enniskerry Road and all the access junctions. Appropriate software was used for all these junctions based on the junction type.

For Enniskerry Road/Glenamuck Road Golden Ball junction, the junction was found to be operating over the capacity during AM peak for Opening Year without GDRS scenarios for both committed and All Development scenarios. However, the impact of the Proposed Development trips was very small. In addition, the delay for both scenarios were around 1 min 50 sec, which is typical for an urban signalised junction. For with GDRS scheme, the vehicles were diverted into new GDDR and GLDR road. Therefore, the junction was found to be operating within the capacity across all the scenarios for both AM and PM peaks. The impact of the development traffic on this junction is low – moderate / slight.

For Enniskerry Road/R116 junction, the LOS was observed to be C for without GDRS scenarios. This suggests that the junction was just at capacity. However, again the impact of the Proposed Development was very small. With GDRS scheme in place, the junction was found to be operating within capacity across all the design years for both AM and PM peak. The impact of the development traffic on this junction is low – moderate / slight.

The Enniskerry/Ballycorus road junction was found to be operating within the capacity since very few vehicles are utilising this junction across all the scenarios. The impact of the development traffic on this junction is negligible.

All the Access Junctions were found to be operating within capacity with minimal impact on the Enniskerry, Glenamuck and GLDR links. The model results indicate that the design for all the junctions as priority junction arrangement (as opposed to a signal junction) is appropriate and correct. The impact of the development traffic on this junction is negligible.

Overall, the impact of development traffic is of the order of low in the case of the without GDRS to negligible when the GDRS is available.

12.1.5.2.11 Public Transport Impact

The following section outlines the potential impact on bus and Luas services respectively that constitute the main public transport provision available to the Proposed Development. Using a mix of TRICS data cross referenced with Census 2016 an estimate of public transport trips to and from the development has been developed and its potential impact on both existing and proposed public transport services available in the study area has been estimated.

The CSO 2016 Small Area Population (SAP) mapping outlined in Section 12.1.5.2.5 we have established existing public transport usage for the 3 small areas adjacent to the site. The CSO SAPs for public transport trips are shown in Table 12-56.

Table 12-56 CSO 2016 SAP - Public Transport Trips

Total Trips across all 3 SAP	Work	Education	Total
Bus	7	29	36
Train, DART or Luas	24	15	39
Totals	31	44	75

According to CSO 2016 departure profile, 71% of all public transport trips take place between 07:00 to 09:00. Based on this profile an adjusted AM peak demand is shown in Table 12-57[20].

Table 12-57 CSO 2016 SAP – Adjusted Public Transport Trips

Total Trips across all 3 SAP	Work	Education	Total
Bus	5	21	25
Train, DART or Luas	17	11	28
Totals	22	31	53

Based on the TRICs exercise undertaken it is anticipated that the development would result in the mode share and split for AM trips as shown in Table 12-58.

Table 12-58 TRICs - Multi-Modal Share

Mode	**Arrival**	**%Split**	**Dep**	**%split**
Total Vehicles	78	81%	180	58%
Cyclists	2	2%	4	1%
Ped	9	9%	68	22%
PT	7	8%	57	18%
Total	96	100%	309	100%

Table 12-58 indicates that the Proposed Development will result in a total of 64 public transport trips during the AM period. Assuming a similar departure profile to existing trips (71% between 07:00 to 09:00) and split of bus versus Train, DART or Luas (47%:53%) results in an adjusted trips by mode as shown in Table 12-59.

Table 12-59 Predicted Public Transport Trip from the Development

Mode	Adjusted Trip Total (71%)	Adjusted Trip by Mode
Bus	45	21
Train, DART or LUAS		24

Table 12-59 predicts that the Proposed Development will create an additional demand for

- circa 21 seats on bus services operating in the vicinity of the site between 07:00-0900; and
- circa 24 seats on Train, DART or Luas services.

The impact of this demand on buses and Luas services is outlined below.

12.1.5.2.11.1 Bus Impact

The current bus services in the vicinity of the site together with bus capacity information are detailed in Section 12.1.3.2.1 and consist of the following services detailed in Table 12-60. The bus services shown in Table 12-60 are located within 10 minutes walk with bus stops located on

[20] Discrepancies due to rounded up / down

Enniskerry Road and Glenamuck Road as shown previously on Figure 12-27. Frequency of service information has been obtained from TFI Journey Planner[21] with theoretical capacity based on a bus capacity of 95 spaces per bus.

Table 12-60 Existing Bus Services and Capacities

Number	Start	Mon-Fri Services per day	Daily capacity	AM – Peak Services(07:00-0900)	AM Peak Total person Capacity	PM Peak (16:00 - 1800)	PM Peak Total person Capacity
63/63A	Dun Laoghaire to Kilternan	34	3230	4	380	4	380
	Kilternan to Dun Laoghaire	35	3325	5	475	4	475
44	DCU to Enniskerry	19	1805	3	285	2	190
	Enniskerry to DCU	18	1710	2	190	2	190
118	Kilternan – D'Oiler St	1	95	1	95	0	0
	D'Oiler Street to Kilternan	0	0	0	0	0	0

Table 12-60 demonstrates that within walking distance of the Proposed Development there is a significant high capacity of circa 3325 daily bus sets towards Dun Laoghaire and circa 1710 daily bus seats towards DCU with corresponding bus capacity in the opposite direction.

During the AM peak it is anticipated that most demand from the Proposed Development would be outbound towards Dun Laoghaire and the City and during the PM peak the reverse movements. Therefore, further analysis focuses on these movements. It should be noted that there are similar bus capacity levels available in the opposite directions in the AM and PM periods.

Based on typical profile of travel the AM periods is usually the period of highest concentration of demand and therefore the assessment of impact focuses on the AM period between 0700-0900.

During the AM peak of 0700-0900 bus services have circa 380 seats capacity from Enniskerry towards Dun Laoghaire (via Ballyogan Wood Luas stop) and circa 190 seats towards DCU with a further 95 seats capacity towards D'Oiler Street. Therefore, there is a total AM bus capacity of circa 665 seats on the surrounding road network.

Based on the above analysis the capacity, demand and percentage impact is shown in Table 12-61.

Table 12-61 Bus Impact of Proposed Developmen

	Seats	Demand	Percentage impact
Total bus capacity	665	21	3.15%

[21] https://www.transportforireland.ie/plan-a-journey/

Based on this high level impact assessment the Proposed Development could create an additional demand for bus seats equating to 3.15% of the current capacity. This is considered negligible, and we believe can be easily accommodated within the current services.

To confirm bus patronage and bus capacity a survey was undertaken in Kilternan on Thursday 26th May 2022. The survey covered the AM (07:00-09:00) and PM peak periods (16:00-18:00) and looked at the number of people boarding and alighting from buses in Kilternan during this time period together with a high level assessment of the bus capacity. Bus stops surveyed are shown in Figure 12-60 . The survey methodology / specification is shown in Appendix E of the TTA submitted separately in support of this planning application.

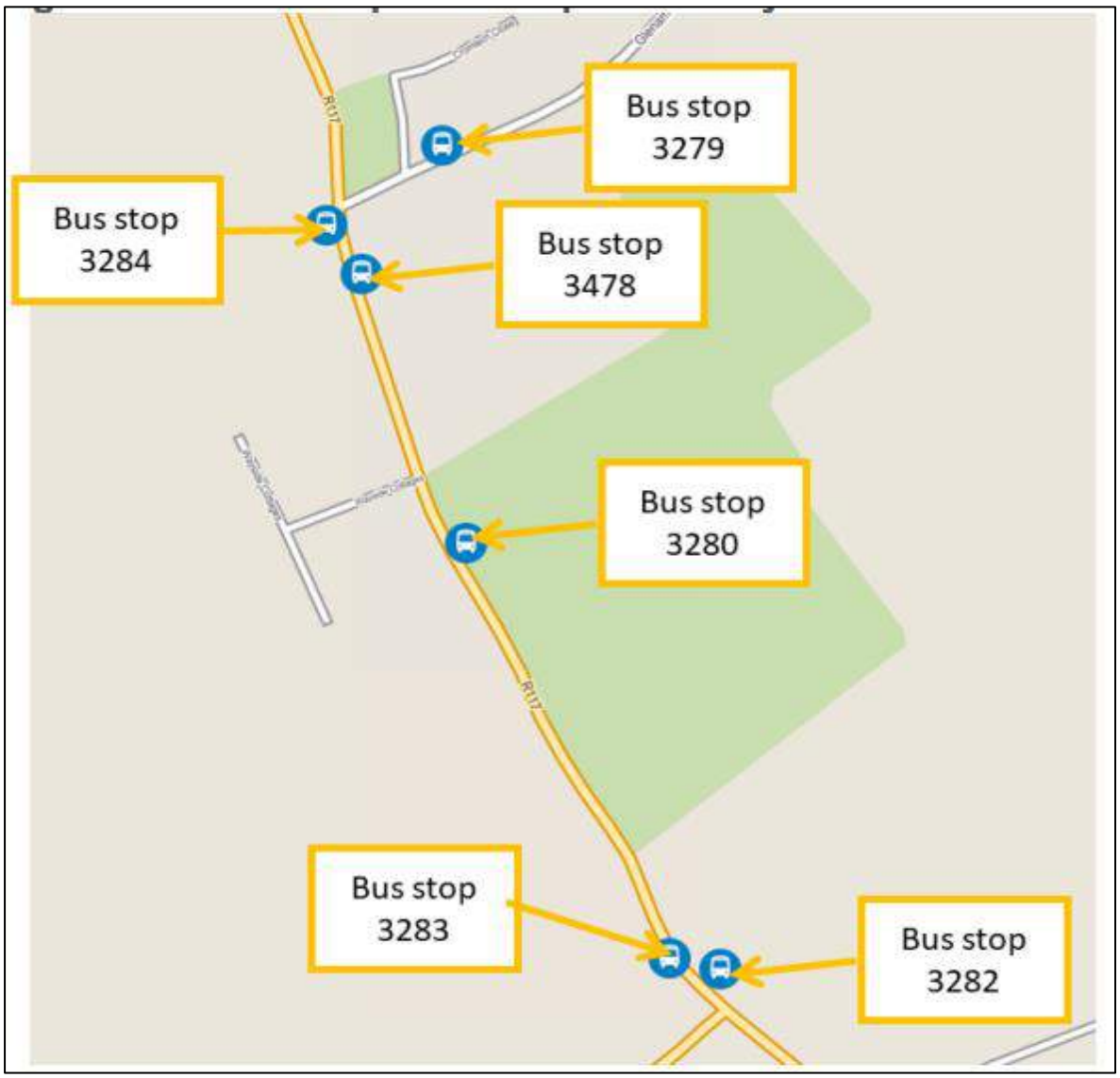

Figure 12-60 Kilternan Bus Stop surveyed

The bus services number, operating time, number of people alighting and boarding and observed occupancy for the AM and PM Peak are summarised in Table 12-62 and Table 12-63 respectively.

Table 12-62 Bus patronage & Occupancy Kilternan AM Peak

Route #	Time	No. Alighting	No. Boarding	Occupancy (%)
63	07:02	0	1	5%
63	07:22	1	0	5%
63	07:25	1	5	60%
63	07:27	0	12	20%
44	07:40	3	1	10%
63	07:45	1	0	5%
118	07:47	0	2	5%
63	07:51	0	4	5%
63	08:08	0	0	5%
63	08:18	0	3	5%
44	08:26	0	0	5%
63	08:53	0	0	5%
Total		6	28	

Table 12-62 shows that during the AM peak period a total of 34 people boarded or alighted form bus services adjacent to the proposed site. In general, bus services operating at this period were observed to have a low occupancy with plenty of spare capacity.

Table 12-63 Bus patronage & Occupancy Kilternan PM Peak

Route #	Time	No. Alighting	No. Boarding	Occupancy (%)
63	16:04	7	0	10%
44	16:08	4	0	20%
63	16:13	0	3	5%
63	16:41	1	0	5%
44	16:41	0	2	20%
63	16:45	0	0	5%
63	17:05	2	0	5%
63	17:11	0	3	5%
44	17:16	2	0	10%
44	17:59	0	0	20%
63	17:59	2	0	5%
Total		18	8	

Table 12-63 shows that during the PM peak period a total of 26 people boarded or alighted form bus services adjacent to the proposed site. In general, bus services operating at this period were observed to have a low occupancy with plenty of spare capacity.

Based on the projected demand of 21 additional journey in the AM peak and current occupancy levels it is anticipated that the Proposed Development would not result in demand for seats that cannot be met by existing bus services in the area.

This survey confirms that the impact of the development on bus services would be negligible.

12.1.5.2.11.2 Luas Impact

Current timetabling of services from Ballyogan Wood Luas Stops was obtained from Luas webpage[22] as shown in Table 12-64.

Table 12-64 Ballyogan Wood Luas Stop timetable of services

Monday to Friday 07:00 - 10:00	Minimum services per hour	Average number of services per hour	Max number of services per hour
Northbound	6	9	14
Southbound	4	9	14

The Green Line currently operates the Citadis 502 type trams (55metres) with a passenger capacity of 408 spaces. Based on this capacity and frequency above the overall capacity of the Luas under min, average and max frequencies is shown in Table 12-65.

Table 12-65 Ballyogan Wood Luas Stop capacity

Monday to Friday 07:00 - 10:00	Minimum services per hour	Average number of services per hour	Max number of services per hour
Northbound	2448	3672	5712
Southbound	1632	3672	5712

Assuming a worst case scenario that in the AM period all demand is northbound, that is towards Dublin City the percentage impact is shown in Table 12-66 based on a loading of 24 seat demand as shown in Table 12-59.

Table 12-66 Ballyogan Wood Luas Stop capacity

Development Demand	% impact on Minimum	% Impact on Average capacity	% Impact on max capacity
24	0.98%	0.65%	0.42%

Based on this high level impact assessment the Proposed Development could create an additional demand for Luas seats ranging from 0.98% to 0.42% of current capacities. This is considered **negligible**, and we believe can be easily accommodated within the current services.

A survey of boarding and alighting and occupancy of Luas services at Ballyogan Wood Luas stop was undertaken on Thursday 26th of May to understand patronage and capacity. Counts during the AM peak (07:00- 09:00) and PM peak (16:00-18:00) were undertaken with the results shown in Table 12-67 and for Luas services to Cherrywood and toward City Table 12-68.

[22] https://luas.ie/ballyogan-wood.html

Table 12-67 Luas patronage & Occupancy toward Cherrywood

Direction	Time	No. Alighting	No. Boarding	Capacity / Occupancy (%)
to Cherrywood	06:59	5	1	10
to Cherrywood	07:04	3	1	10
to Cherrywood	07:15	3	0	10
to Cherrywood	07:22	5	1	5
to Cherrywood	07:28	9	0	10
to Cherrywood	07:38	8	2	15
to Cherrywood	07:43	1	0	5
to Cherrywood	07:48	1	1	5
to Cherrywood	07:56	3	1	5
to Cherrywood	08:02	4	2	5
to Cherrywood	08:06	4	0	5
to Cherrywood	08:11	2	1	10
to Cherrywood	08:16	3	0	5
to Cherrywood	08:21	5	3	5
to Cherrywood	08:28	5	0	5
to Cherrywood	08:40	15	1	25
to Cherrywood	08:47	6	1	10
to Cherrywood	08:56	7	0	5
to Cherrywood	09:05	8	0	5
Evening				
to Cherrywood	16:09	8	1	10
to Cherrywood	16:10	11	1	10
to Cherrywood	16:15	3	1	5
to Cherrywood	16:28	15	1	10
to Cherrywood	16:39	13	1	10
to Cherrywood	16:44	0	0	5
to Cherrywood	16:53	8	1	10
to Cherrywood	17:04	17	2	10
to Cherrywood	17:16	21	8	10
to Cherrywood	17:28	26	0	35
to Cherrywood	17:34	8	0	15
to Cherrywood	17:45	16	0	20
to Cherrywood	18:07	23	1	60

Table 12-68 Luas patronage and occupancy towards City

Direction	Time	No. Alighting	No. Boarding	Capacity- Occupancy (%)
to City	07:00	0	3	5
to City	07:09	2	3	5
to City	07:23	1	2	5
to City	07:29	0	0	5
to City	07:36	0	18	5
to City	07:45	0	3	5
to City	07:52	3	6	5
to City	08:01	3	22	10
to City	08:09	0	17	10
to City	08:14	0	11	5
to City	08:16	0	3	5
to City	08:24	0	17	10
to City	08:31	3	7	5
to City	08:32	1	2	5
to City	08:40	0	4	5
to City	08:44	0	9	5
to City	08:49	1	3	5
to City	08:59	0	3	5
Evening				
to City	16:00	1	13	20
to City	16:09	4	18	15
to City	16:17	0	14	10
to City	16:26	0	5	10
to City	16:32	2	14	15
to City	16:40	1	5	10
to City	16:53	6	13	25
to City	17:04	0	10	15
to City	17:12	1	10	30
to City	17:22	4	12	40
to City	17:32	1	14	30
to City	17:40	1	7	20
to City	17:51	3	12	40
to City	17:57	1	14	30

Both tables show that during the peak periods Luas services in both directions have spare capacity at Ballyogan Wood. Based on an additional loading of 24 spaces during the AM peak period it is anticipated that the development would not result in additional loading that would result in capacity issues for existing patronage levels.

12.1.5.2.12 Walking and Cycling Impact

As detailed in Section 12.1.4.2 and Section 12.1.4.3 the Proposed Development will provide a comprehensive interconnected network of pedestrian and cycle facilities as shown in Figure 12-61 and Figure 12-62.

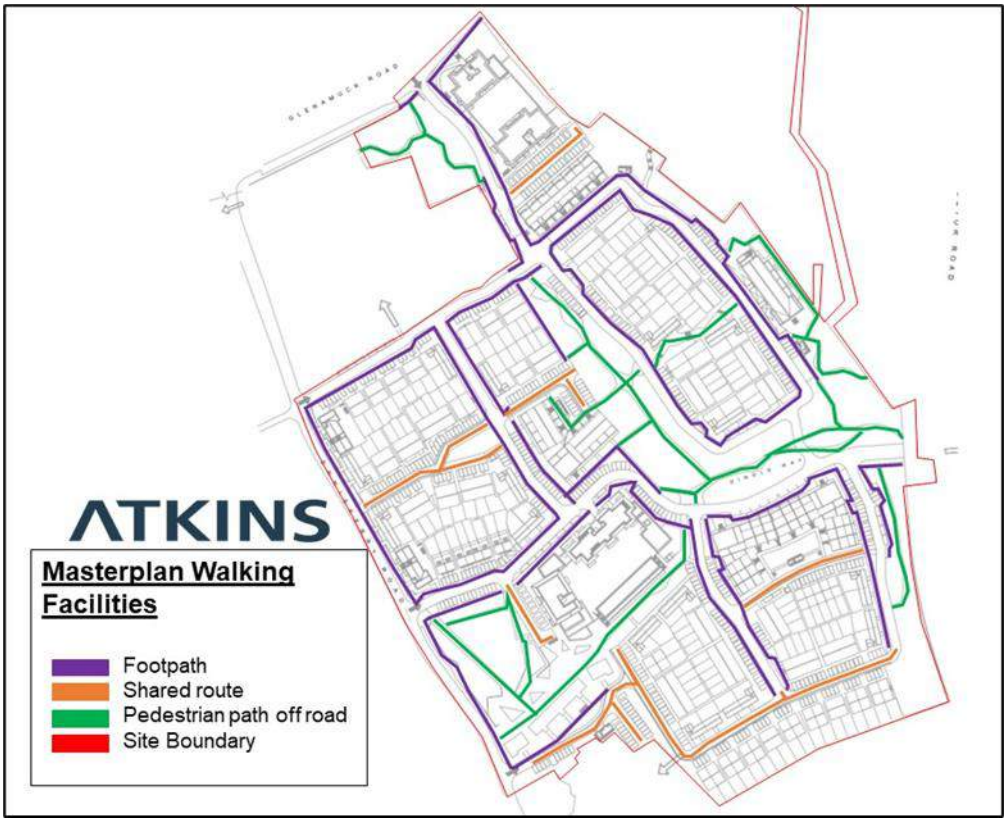

Figure 12-61 Walking facilities within the Masterplan

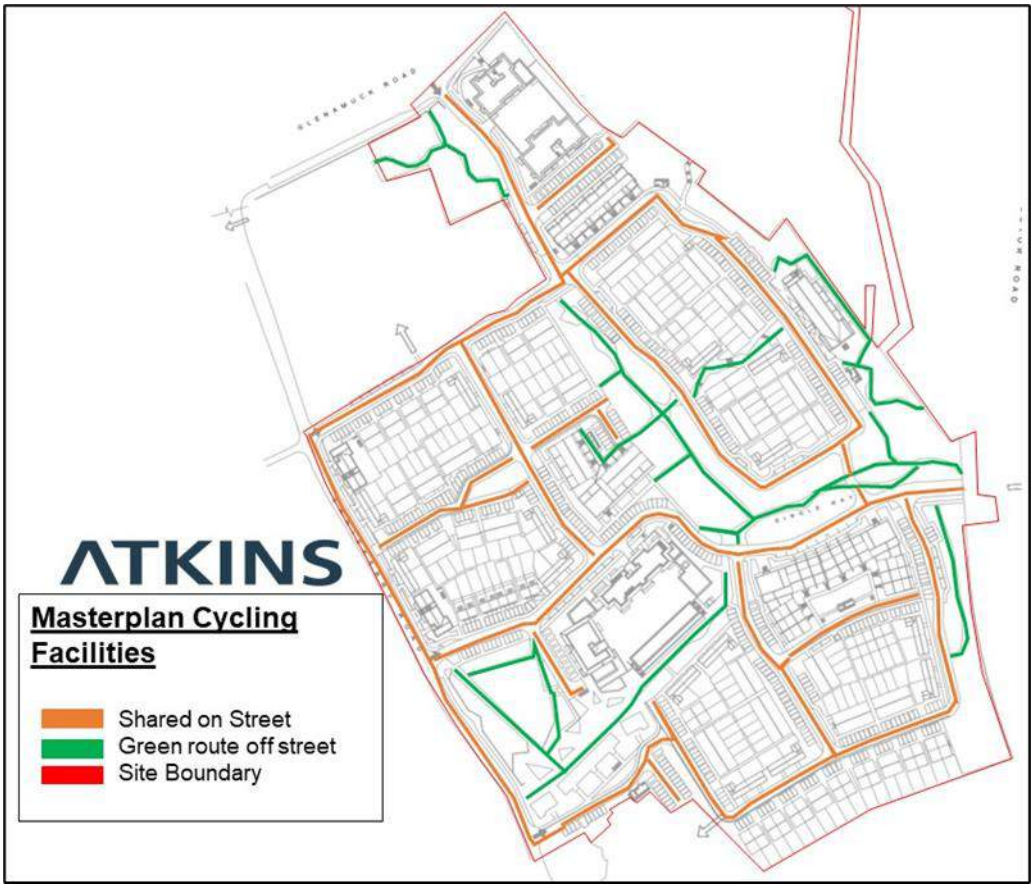

Figure 12-62 Masterplan Cycle Provision

The mixed use nature of the site and proximity of a range of services interconnected by a network of streets encourages the use of active travel. The urban realm within the development has been designed as an attractive landscaped environment that is overlook with good lighting that facilitates movement through the development.

The masterplan layout has been designed in accordance with DMURS and NCM to encourage active travel by being permeable and provide a range of cyclist facilities for all ages and abilities including fully segregated cycle facilities.

The development incorporates a mix of cycling parking facilities to encourage and promote that use. Long stay secure sheltered and accessible cycle parking will be provided within the development site for residents. Short stay cycle parking will be provided at various locations within and around the development to facilitate visitor cycle parking.

The Proposed Development incorporates improvements to the urban realm on Enniskerry Road as set out in Section 12.1.4.5 that will further improve pedestrian and cycle provisions in the surrounding area for both the future residents of the development, existing Kilternan residents and visitors to the area. The Proposed Development will connect into the existing and future walking and cycling network in the area as shown in Section 12.1.3.1 and Section 12.1.3.6.3 to provide a wider interconnected network of streets that will help encourage walking and cycling.

Based on the above factors the Proposed Development will deliver significant permanent beneficial impacts to pedestrian and cyclist.

12.1.5.3 Potential Cumulative Impacts

The assessment outlined above include an assessment of cumulative impacts as it takes account of permitted and committed developments and future year scenarios include a growth in traffic to reflect network growth. This approach in line with TII Traffic and Transport Assessment Guidelines.

12.1.5.4 "Do-Nothing" Impact

The traffic modelling presented in Section 12.1.5.2.10 includes the future year scenarios for opening year, opening year +5 and opening year +15 without development, i.e., the "do nothing" impact. The future year scenario with development has bene compared to the future year do nothing scenario to understand and show the developments traffic impacts. In relation to public transport "do nothing" scenario demand for bus and Luas services from Kilternan would be consistent with demand from the hinterland without the development.

12.1.6 Avoidance, Remedial & Mitigation Measures

12.1.6.1 Construction Phase

Based on the analysis undertaken in Section 12.1.5.1 the traffic impacts associated with construction of the Proposed Development are expected to be negligible. An outline Construction Management Plan provides details of measures proposed to further reduce the impact of construction activity. As the contractor to build the development has not been awarded and the construction programme and methodology may change a detailed construction management plan could be provide and agreed with the Planning Authority prior to work commencing on site.

12.1.6.2 Operational Phase

N/A

12.1.6.3 "Worst Case" Scenario

The assessment of impact set out in this Chapter such as trips rates and modal shift patterns are reflective of a worst-case scenario to show the impact of the development on the traffic and transport network. This accords with TII guidance on the Assessment of Traffic and Transport Assessments.

12.1.7 Residual Impacts

12.1.7.1 Construction Phase

During demolition and construction phase the Proposed Development will result in a temporary increase in traffic volumes along the construction route. However, as set out in Section 12.1.5.1.6 these increases will be negligible and temporary in nature.

As no significant adverse effects have been identified in the assessment of the demolition and construction phase of the development, no additional mitigation is necessary over and above the Construction Traffic Management Plan (CTMP) which forms part of the mitigation measures outlined in this Chapter.

12.1.7.2 Operational Phase

Once operational the Proposed Development will result in changes to traffic flows on several road links within the study area. However, as set out in Section 12.1.5.2.10 of this Chapter, these increases are in the range of moderate to slight and not significant.

The impact of the Proposed Development on pedestrians, cyclists and public transport users (buses and Luas) is predicted to be significant and beneficial.

The residual impacts in terms of traffic are considered further in Chapters 8, Air Quality, and Chapter 9, Noise and Vibration, which are the direct environmental impacts because of increased traffic.

12.1.8 Monitoring

Based on the result no monitoring is required.

12.1.8.1 Construction Phase

Based on the result no monitoring is required.

12.1.8.2 Operational Phase

Based on the result no monitoring is required.

12.1.9 Interactions

12.1.9.1 Population and Human Health

Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of vehicles. There is potential for impacts on population and human health in relation to the capacity and operation of the surrounding road network. However according to Chapter 12.1 Traffic, the impact of development traffic is of the order of low in the case of the without GDRS to negligible when the GDRS is available.

12.1.9.2 Air Quality and Climate

There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate and traffic is insignificant.

12.1.9.3 Noise and Vibrations

Traffic has the potential to increase noise impacts on nearby sensitive receptors. The Proposed Development will have no significant impact on overall traffic volumes and therefore traffic will not result in any significant increases of noise at sensitive receptors.

12.1.10 Difficulties Encountered When Compiling

No difficulties were encountered when compiling this Chapter.

12.1.11 References

The following is a list of sources of information consulted for use in this Chapter:

- European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018;
- Planning and Development Act 2000 (as amended);
- Planning and Development Regulations 2001-2021;
- Directive 2011/92/EU;
- Directive 2014/52/EU;
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems – Key Issues Consultation Paper (2017; DoHPCLG);
- Preparation of guidance documents for the implementation of EIA directive (Directive 2011/92/EU as amended by 2014/52/EU) – Annex I to the Final Report (COWI, Milieu; April 2017);
- Guidelines on the information to be contained in environmental impact assessment reports, EPA, (2022)
- Environmental Impact Assessment – Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018; DoHPLG); and
- Guidance for Consent Authorities regarding Sub-threshold Development (2003; DoEHLG).
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)
- Transport Infrastructure Ireland (TII) Transport Assessment Guidelines (TII, 2014);
- Department of Transport Tourism and Sport (DTTaS) The Traffic Signs Manual (2010);
- Department of Transport Tourism and Sport - The Design Manual for Roads and Bridges (DMRB);
- The Design Manual for Urban Roads and Streets (DMURS) (DTTAS, 2013);
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines (PAG) Unit 16.0 – Estimating AADT on National Roads;
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines (PAG) Unit 16.1 – Expansion Factors for Short Period Traffic Counts;
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines (PAG) – Unit 5.5 Link Based Traffic Growth Forecasting;

12.2 Waste and Utilities

12.2.1 Introduction

Material Assets have been defined as "*Resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons*" (EPA 2002).

The definition of Material Assets was further expanded by the EPA in the 2022 publication 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' which states:

"*In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils*."

The scope and definition of Material Assets within the context of the EIA process has been defined by the EIA Directive as including Architectural and Archaeological Heritage or Cultural Heritage. These elements are assessed separately in Chapter 11 of this EIAR under Archaeology & Cultural Heritage.

This Chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the potential impacts of the Proposed Development on Material Assets or physical resources in the environment of human origin including built services and infrastructure comprising:

- Electricity Supply,
- Gas Supply,
- Information and Communications Technology,
- Surface Water Drainage,
- Water Supply and Demand,
- Wastewater Management, and
- Waste Management

Natural resources (water, land, biodiversity, air etc) are addressed in their respective Chapters. The Energy Statement produced by Waterman Moylan (2022), and included in this EIAR as Appendix B, provides details of the raw materials to be used as building materials for the Proposed Development.

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

12.2.2 Study Methodology

The methodology adopted for the assessment takes cognisance of the following relevant guidelines:

- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)
- EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements.
- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

The scope of work undertaken for the assessment included a desk-based study of material assets, namely built services, utilities and infrastructure associated with the existing site and the Proposed Development. All phases of the Proposed Development were considered in the assessment of potential impacts on material assets.

Information on built assets in the vicinity of the site of the Proposed Development was assembled by the following means:

- A desktop review of ESB Networks Utility Maps, Irish Water Utility Plans, Gas Networks Ireland Service plans, EIR E-Maps, Engineering Infrastructure Report and Stormwater Impact Assessment, Telecommunications Report, Construction and Demolition Waste Management Plan, Operational Waste Management Plan, Energy Statement and Building Life Cycle Report.

Assessment of the likely impact of features of the Proposed Development, was carried out in accordance with the following guidelines:

- Greater Dublin Regional Code of Practice for Drainage Works
- Greater Dublin Sustainable Drainage System (2005)
- CIRIA Report c753 “The SuDS Manual” (2015)
- ESB Networks National Code of Practice for the Customer Interface Version 5 (2021)
- ESB Networks Construction Standards for MV Substation Buildings (2019).
- Section 3.2 of the Building Height Guidelines (2018)
- Eastern-Midlands Region Waste Management Plan 2015-2021.

12.2.2.1 Prediction and Assessment of Impacts

Impacts were predicted and assess based on EPA guidance (2022) and by using the definitions detailed in Tables 12-69 to 12-73. Impacts will vary from negative to neutral or positive, and also will vary in significance on the receiving environment.

Table 12-69 Terminology used to assess the quality potential impacts & effects

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.

Source: EPA, 2022

Table 12-70 Terminology used to assess the significance of potential impacts & effects

Significance of Effects / Impacts	Definition
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 a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Source: EPA, 2022

Table 12-71 Terminology used to assess the duration of potential impacts/effects

Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Source: EPA, 2022

Table 12-72 Definition of the Extent and Context of Effects

Quality	Definition
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Source: EPA, 2022

Table 12-73 Definition of the Probability of Effects

Quality	Definition
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Source: EPA, 2022

Figure 12-63 (extracted from the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022) shows how the character of the predicted impact in relation to the sensitivity of the receiving environment can determine the significance of the impact.

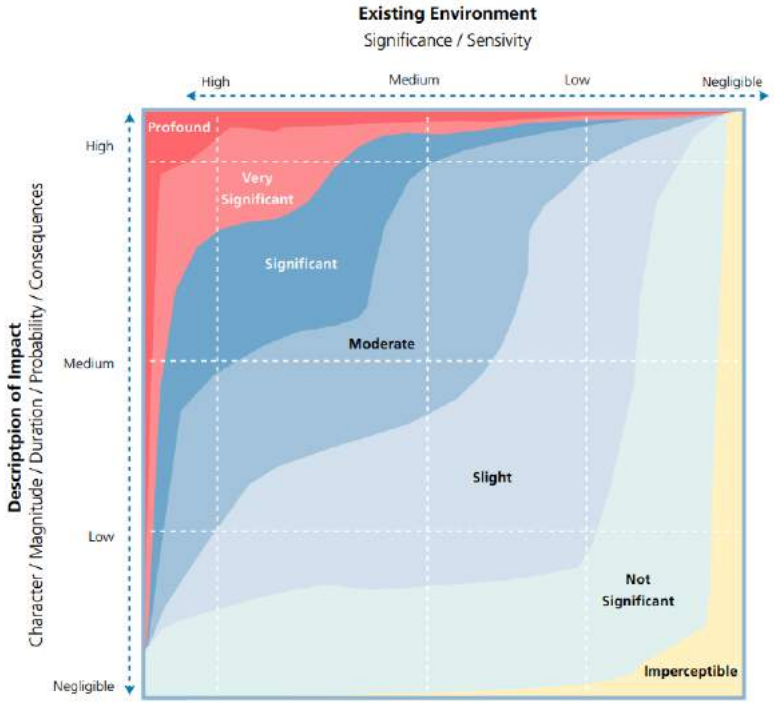

Figure 12-63 Chart showing typical classifications of the significance of impacts (EPA, 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports)

12.2.3 The Existing and Receiving Environment (Baseline Situation)

12.2.3.1 Site Location

Liscove Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at this 11.2 Ha site at lands at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18, which include a derelict dwelling known as 'Rockville' and associated derelict outbuildings, Enniskerry Road, Kilternan, Dublin 18, D18 Y199.

The site is generally bounded by the Glenamuck Road to the north; hedgerows/trees and the Kilternan Farmers Market and the Sancta Maria residence to the north-west; an existing stone wall and the recently constructed residential development named "Rockville" to the north-east; a 1.2m high existing stone wall and the Enniskerry Road to the south-west; a petrol station and detached house rear gardens to the south; and open green field lands that will facilitate the future Glenamuck Link Distributor Road to the east. Part of the Site's frontage lies directly opposite Our Lady of the Wayside Church, Kilternan. The lands are located 1.9 km to the south-west of the M50 and Carrickmines Retail Park.

12.2.3.1.1 Land Use History

Historical mapping and aerial photography available from the Ordinance Survey of Ireland website (OSI, 2021) were reviewed and key observations on-site and off-site are summarised in Table 12-74.

Table 12-74 Historical Land Use

Date	Information Source	Site Description
1837-1842	**OSI map 6inch**	**On-site:** The site lies in the townland of Glenamuck South. The northern and western sections of the site incorporate part of Rockville House's grounds and a thick treelined boundary of the estate. A Post Office is in the southern section of the site. The rest of the site consists of agricultural fields. **Off-site:** Glebe House and Glenamuck House and their grounds are situated to the north of the site; Kilternan House, Domain and Lodge lie to the west of the site; and a cotton factory is situated south of the site. The landscape to the east is rural, with Dingle Glen visible on the map, and singular dwellings, sections of woodland and agricultural fields. Sand pits, gravel pits and quarries are visible in the wider area.
1888-1913	**OSI map 25inch**	**On-site:** No significant changes **Off-site:** No significant changes
1830-1930	**OSI Cassini map 6inch**	**On-site:** No significant changes **Off-site:** The surrounding area has become more residential with the construction of Golden Ball Cottages to the north of the site and Wayside Cottages to the west of the site. Our Lady of the Wayside Church has been built to the south of the site. The rest of the surrounding landscape remains predominantly agricultural.
1995	**OSI Aerial photography**	**On-site:** The grounds of Rockville House have been reduced and a football pitch (Wayside Celtic Football Club) has been established in the northern section of the site. The rest of the site remains relatively unchanged apart from an access road splitting the field in the eastern half of the site. **Off-site:** Kilternan Country Market and a coal yard have been built in the section of land which is bound by the Enniskerry Road and the Glenamuck Road adjacent to the northwest of the site. The surrounding area has become increasingly residential with the construction of more houses along the Enniskerry Road and the Ballycorus Road. The immediate surroundings remain predominantly agricultural. Significant urban sprawl has occurred to the north of the site.
2000	**OSI Aerial photography**	**On-site:** No significant changes **Off-site:** No significant changes
2005	**OSI Aerial photography**	**On-site:** No significant changes **Off-site:** Construction of the southern portion of the M50 motorway has begun approximately 2 km north and east of the site. Construction of the Dun Laoghaire golfclub is underway 2.5 km to the south of the site.
2005-2013	**OSI Aerial Photography**	**On-site:** No significant changes **Off-site:** Wayside Celtic Football Club have developed new grounds to the northeast of the site.
2021	**Google Maps Photography**	**On-site:** No significant changes **Off-site:** Rockville House and Gardens has been developed into a housing estate. The main house and gate lodge remain and have been redeveloped. The M50 motorway and the Dun Laoghaire golfclub are both complete.

12.2.3.1.2 Immediate Surroundings

The surrounding area is predominantly residential and agricultural. The site of the Proposed Development is bounded by the Glenamuck Road to the north; Kilternan Farmers Market and the Sancta Maria residence to the north-west; a recently constructed residential development named "Rockville (Phase1)" to the north-east; the Enniskerry Road to the south-west; a petrol station to the south; and lands that will facilitate the future Glenamuck Link Distributor Road to the east. Phase 2 of “Rockville” has been granted permission (under two separate Planning References, D18A/0566 (Phase 2A) and D20A/0015 (Phase 2B)), and it is planned to link the Proposed Development into Rockville.

12.2.3.1.3 Local Settlement and Land Use

The Proposed Development site is well located, served by public transport and is within a short distance of key employment locations such as Kilternan Village, Carrickmines, Enniskerry, Sandyford Business District, Dundrum and links to the M50. The Ballyogan Wood LUAS stop is located 2.5 km to the north-east (29 No. minute walk). Access to the M50 Carrickmines (Exit 15) is located 1.9 km from the Site, a 3 No. minute car journey away. Bus route Nos. 44, 63 and 118 serve the Kilternan and Glenamuck area with direct links to Dublin City Centre and institutions such as Dublin City University in Glasnevin. There are also several proposed new bus routes for Kilternan within the Bus Connects scheme will serve Kilternan Village and offer transport links to Dublin City Centre and other suburbs and employment and education facilities in the Greater Dublin Area such as University College Dublin. The Proposed Development is also well located in relation to natural recreational and amenity areas, as the Dublin Mountains lie approximately 3km to the west of the Site of the Proposed Development, and the Irish Sea is located approximately 6km to the east of the Proposed Development.

12.2.3.2 Electricity Supply

12.2.3.2.1 Local Supply & Grid Connection

The site is well located with regards to electrical supply infrastructure. There is both high voltage transmission lines and local distribution infrastructure in the area with a mix of overhead and underground cables. High voltage overhead infrastructure consists of the Arklow – Carrickmines 220kV Double Circuit Route which runs along the eastern boundary of the site.

12.2.3.2.2 Onsite Supply and Consumption

The Site is currently greenfield and has been used as playing pitches and for agriculture. There is currently no onsite consumption of electricity.

12.2.3.3 Gas supply

Gas Networks Ireland builds, develops and operates Ireland’s gas infrastructure, maintaining over 14,521 km of gas pipelines and two sub-sea interconnectors. Gas Networks Ireland is responsible for connecting all new gas customers to the network, and for work on service pipes and meters at customers’ premises, on behalf of all gas suppliers in Ireland.

According to the utilities map from Gas Networks Ireland, there is a medium pressure distribution pipe along the Glenamuck Road and Enniskerry Road South in addition to feeds to various local developments.

12.2.3.4 Information and Communications Technology (ICT)

National Broadband Ireland was set up by the Irish Government to facilitate the roll out of fibre broadband across the Country. The Department of the Environment, Climate and Communications have developed an interactive map which details the progress of the rollout of the National Broadband Plan. The High-Speed Broadband map[23] identifies locations and premises as amber or blue and the map is updated on a quarterly basis. Amber areas depict target areas for the State intervention of the National Broadband Plan. Blue areas indicated that commercial operators have instated or are in the process of delivering high speed broadband services. The Enniskerry Road, Glenamuck Road and the Site of the Proposed Development are located within a Blue area and High speed broadband is available.

In terms of mobile telecommunication for transmission and reception, the closest mobile communications mast hosting Three and Eir antenna is located along the southern boundary of the Site of the Proposed Development.

The Site is currently greenfield, hence ICT infrastructure is not established or in place.

12.2.3.5 Local Hydrology and Hydrogeology

The Proposed Development has been mapped by the EPA (EPA, 2022) as within the Ovoca-Vartry WFD Catchment (ID: 10), the Ovoca-Vartry Hydrometric Area (HA10), the Dargle_SC_010 Sub-Catchment, (Sub-catchment ID: 10_5) and the Carrickmines Stream_010 WFD River Sub Basin (EU Code: IE_EA_10C040350).

The closest surface water feature is named locally and recorded on the EPA database (EPA, 2022) as the Shanganagh River (also known as the Loughlinstown River) which is located approximately 0.27km south-southeast of the site of the Proposed Development and flows eastwards, discharging into Killiney Bay, approximately 5.21km east of the Proposed Development site.

The Glenamuck North River is located approximately 0.42km north of the site of the Proposed Development and flows north eastwards before converging with the Carrickmines Stream approximately 2.00km northeast of the Proposed Development site. The Carrickmines Streams flows east and converges with the Glenamuck River approximately 3.81km east of the Proposed Development site (EPA, 2022). The Carrickmines Stream merges with the Shanganagh River upstream of its discharge to the Irish Sea at Shanganagh.

The soils beneath the majority of the Proposed Development site have been mapped by Teagasc (Teagasc, 2022) as '*till derived chiefly from granite (TGr)*' and described as '*deep well drained mineral (Mainly acidic) (AminDW)*'. The soils beneath a section of the northern portion of the site and the southeast corner of the site is mapped as '*Made Ground (Made)*'.

12.2.3.6 On-site Surface Water Drainage

The site is a greenfield site composed of former grass-based playing fields pitches and agricultural fields bounded by mature hedgerows and treelines. As such, surface water currently infiltrates to ground and run-off discharges to the surrounding watercourses in line with the existing topography of the site. The existing site topography generally slopes from the Southwest towards the Northeast, i.e., the ground falls away from the Enniskerry Road

[23] https://www.gov.ie/en/publication/5634d-national-broadband-plan-map/#interactive-map

towards the Glenamuck Road South, with a drop in level across the land by c.10.2m from the highest point on the site (143.07mOD) to the lowest (132.85mOD). The general topography outside the Proposed Development site and the surrounding lands is downwards towards the Glenamuck Road and the adjacent roadside ditch. There is an existing open roadside ditch along the northern edge of Glenamuck Road.

There is a roadside drainage channel along the northern side of the Glenamuck Road to the north of the Site of the Proposed Development. This roadside drainage channel currently serves as the drainage channel for the Glenamuck Road. As part of the Glenamuck District Roads Scheme (GDRS) this roadside drainage channel will be incorporated into drainage infrastructure for that project. This surface water drainage infrastructure will involve the construction of new regional attenuation ponds. The enabling works for the GDRS have already commenced.

12.2.3.7 Water Supply and Demand

The Site of the Proposed Development is greenfield and there is no water supply or demand at present. The Site is currently not connected to a municipal water supply, but it is located in a well-serviced area. There are a number of Irish Water watermains in the vicinity of the Proposed Development.

12.2.3.8 Wastewater management

The Site is greenfield and as such there are no wastewater management requirements at present, and there is currently no existing connection to a public sewer at the Site of the Proposed Development. There are a number of Irish Water foul sewers in the vicinity of the Proposed Development.

12.2.3.9 Waste Management

Dun-Laoghaire Rathdown (DLR) is the local authority responsible for setting and administering waste management activities in the area of the Proposed Development. DLR's waste management activities are governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021. The Proposed Development siteis currently a greenfield site and therefore has no waste management requirements.

12.2.4 Characteristics of the Proposed Development

The Proposed Development will comprise the demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre (2,512 sq m) including creche, office, medical, retail, convenience retail and a community facility. The 383 No. residential units will consist of 27 No. 1 bedroom units, 128 No. 2 bedroom units, 171 No. 3 bedroom units and 57 No. 4 bedroom units. The scheme includes pedestrian/cycle links, 678 No. car parking spaces, hard and soft landscaping, boundary treatments and all associated site works.

12.2.5 Potential Impact of the Proposed Development

This section assesses the impact of the Proposed Development on the Material Assets of the area.

12.2.5.1 Electricity Supply

12.2.5.1.1 Construction Phase

Construction related activities will require temporary connection to the local electrical supply network. The Main Contractor will apply for a power supply from ESB Networks to power both the construction compound and the construction site. The size of supply will be calculated to ensure it is sufficient to power both the site compounds and construction site activities. Mobile diesel-powered generators may also be used during the Construction Phase.

Connecting a new multi-unit housing development to the electricity distribution system must be carried out in accordance with ESB Networks' specifications, and in particular with the guidance provided in the documents ESB Networks National Code of Practice for the Customer Interface Version 5 (2021) and ESB Networks Construction Standards for MV Substation Buildings (2019). The developer must undertake the preparatory work such as installation of ducting and provision of substation plinth or building. Once the preparation work has been completed to a satisfactory standard, ESB Networks will commence installation of the electricity cabling/lines and any other necessary equipment. A temporary suspension of the network locally to facilitate the connection works may be required during the Construction Phase, and an additional temporary suspension will also occur when power is provided to the Site of the Proposed Development. These temporary suspensions will be controlled by ESB Networks as the statutory undertaker and in accordance with standard protocols.

The potential impact from the Construction Phase of the Proposed Development on the local electrical supply network is likely to be negative, slight, and short-term.

12.2.5.1.2 Operational Phase

Electricity will be required to provide public lighting, domestic lighting, power supply and heating for each individual unit for the Proposed Development. Electric car charging facilities will be provided in the car park in line with Government policy.

An Energy Statement (Waterman Moylan, 2022) has been prepared for the Operational Phase of the Proposed Development, which provides details on the mechanical and electrical services that will be installed at the Proposed Development. Air to Water Source Heat Pumps (AWSHP) will be installed in the residential dwellings and will be used for both domestic hot water and domestic heating. Mechanical Extract Ventilation will be installed in order to continually ventilate wet, utility and kitchen areas.

All public and amenity lighting will use low energy LED light fittings and be installed in line with DLRCC specifications. LED light fittings with presence-detection will also be used throughout circulation areas and will be locally controlled in apartments.

The impact of the Operational Phase of the Proposed Development on the electricity supply network is likely to be to increase demand to the existing supply. The potential impact from the Operational Phase on the electricity supply network is likely to be neutral and not significant in the long term.

12.2.5.2 Gas Supply

12.2.5.2.1 Construction Phase

Connecting a new multi-unit housing development to the gas network system must be carried out in accordance with Gas Networks Ireland's specifications. The developer must employ the services of a registered mechanical installer or plumber and select and register with a natural gas supplier. A temporary suspension of the network locally to facilitate the connection works may be required during the Construction Phase These temporary suspensions will be controlled by Gas Networks Ireland as the statutory undertaker and in accordance with standard protocols. The potential impact from the Construction Phase of the Proposed Development on the local gas supply network is likely to be negative, slight, and short-term.

12.2.5.2.2 Operational Phase

The use of natural gas to provide heating and hot water to dwellings is very common in urban housing developments due to its convenience and low fuel prices. High efficiency gas fired condensing boilers convert gas to heat energy with an efficiency of over 90%. In this case, the gas boiler will only be used to provide space heating to the dwellings. The potential impact from the Operational Phase on the gas supply network is likely to be neutral and not significant in the long term.

12.2.5.3 Information and Communications Technology (ICT)

12.2.5.3.1 Construction Phase

A specific Telecommunications Report has been compiled by Independent Site Management (ISM) (2022) regarding the telecommunication channels (such as microwave links) at the Site of the Proposed Development to satisfy the criteria of Section 3.2 of the Building Height Guidelines (2018). The Telecommunications Report has reviewed the Proposed Development together with the proposed allowances to retain relevant telecommunication channels in the context of the immediate surrounding registered and documented telecommunication sites.

The assessment conducted by ISM identified 2 no. microwave links and 6 no. radio frequency links which will be impacted by the height of the Proposed Development (ISM, 2022). To provide an adequate allowance for the retention of these and future telecommunication channels that may be impacted by the height and scale of the Proposed Development, it is proposed in the Telecommunications Report to decommission the existing telecommunications mast at ground level and to provide new telecommunications infrastructure at roof level of the Neighbourhood Centre including shrouds, antennas and microwave link dishes (18 no. antennas and 6 no. transmission dishes, all enclosed in 9 no. shrouds together with all associated equipment). The full Telecommunications Report (ISM, 2022) is included in this EIAR as Appendix F.

Connections will be required to the existing ICT network during the Construction Phase of the Proposed Development which, if not conducted in accordance with best practice, has the potential to impact on local telecoms & ICT connectivity. However, due to the *temporary* and phased nature of the Construction Phase the potential impact of the Construction Phase on the local telecoms network is considered negative and not-significant.

12.2.5.3.2 Operational Phase

The Telecommunication Report (ISM, 2022) compiled for the Proposed Development concludes that the proposal allows for the retention of important Telecommunication Channels, such as Microwave links, and therefore satisfies the criteria of Section 3.2 of the Building Height Guidelines (2018). Hence the impact of the Proposed Development on surrounding telecommunication channels is likely to be neutral and imperceptible in the long term. The impact of the Operational Phase of the Proposed Development on the telecoms network is likely to be a marginal increase in demand. The Site of the Proposed Development is located within an area where high speed broadband is available, and as such, the impact from the Operational Phase on the telecoms network is likely to be neutral and not-significant in the long term.

12.2.5.4 Local Hydrology and Hydrogeology

It is noted that specific issues relating to Hydrology associated with the Proposed Development are set out in Chapter 7 of this EIAR. There will be no abstraction required from surface water bodies or groundwater aquifers at the Site of the Proposed Development during the Construction or Operational Phase, and there will be no direct discharges of untreated water to surface water or groundwater during the Construction or Operational Phase.

12.2.5.4.1 Construction Phase

The Groundwater Vulnerability at the Site of the Proposed Development is recorded by the Geological Survey Ireland (GSI) as high (H) (GSI, 2022). “Groundwater Vulnerability” can be defined as the ease with which groundwater may be contaminated by human activities. The excavation works required to achieve the formation levels for the Proposed Development and the removal of soil and stone from the Site will temporarily increase the exposure of the groundwater beneath the Site to human activities, which will have an unavoidable negative, slight and temporary impact on the vulnerability of the underlying aquifer. All building foundations are shallow strip foundations on bedrock with no requirement for piling. It is anticipated that excavations for foundations will be above groundwater however, locally groundwater may be encountered during deeper excavations for drainage. Furthermore, there is a potential risk associated with the cementitious materials used during the construction of foundations, pavements and other structures impacting on the underlying groundwater at the Proposed Development Site. Additionally, if the accidental release of hazardous material such as fuels and chemicals, through the failure of secondary containment or a spillage incident on the Proposed Development Site, were to occur over open ground then these materials could infiltrate to the underlying groundwater or enter shallow perched groundwater during excavations. In the event of such scenarios, it is considered that this could result in a negative, significant, long-term impact on the receiving hydrogeological environment depending on the nature of the incident. Overall, in the absence of mitigation, the Proposed Development has the potential to result in a *negative,* slight to significant and temporary to long-term impact on local hydrogeology during the Construction Phase.

12.2.5.4.2 Operational Phase

During the Operational Phase of the Proposed Development there is limited to zero potential for any adverse impact on the receiving water (hydrological and hydrogeological) environment at the Site of the Proposed Development. As the current greenfield lands will be replaced by hardstanding areas in the Proposed Development, the permeability of the surface cover at the

Site will be modified, however, infiltration to ground will continue via the filter drains, permeable paving, tree pits and bioretention areas. While there may be local variations in the mechanism for groundwater recharge, the overall regional groundwater flow regime will not be altered. Any impact on the hydrogeological regime and ground water flow is unavoidable, however, overall, the impact will be neutral, imperceptible, long-term and only within a very localised zone of the underlying aquifer.

12.2.5.5 Surface Water Drainage

It is noted that a full Stormwater Impact Assessment has been completed for the Proposed Development by Roger Mullarkey & Associates and is included in the report entitled "Engineering Infrastructure Report & Stormwater Impact Assessment" (2022). The SuDS treatment train approach has been implemented in accordance with the CIRIA SuDS Manual and is fully described in the aforementioned report by Roger Mullarkey & Associates. A Site-Specific Flood Risk Assessment has also been completed for the Proposed Development (Roger Mullarkey & Associates, 2022). Additionally, specific details relating to the potential impacts of the Proposed Development on surface water quality as a result of the Proposed Development are set out in Chapter 7 of this EIAR.

12.2.5.5.1 Construction Phase

There will be no discharge to groundwater or surface water during the Construction Phase. Temporary diversions of surface water courses are not required for the Construction Phase, however there may be a requirement for management of surface water (rainwater) and shallow groundwater were encountered during groundworks. Surface runoff entrained with sediment is unlikely to result in an impact on receiving water courses as there is no direct connection for the Construction Phase based on the existing Site condition.

Construction Phase activities at the Proposed Development Site that could potentially impact on water quality are detailed in the Hydrology Chapter of this EIAR and control measures for potential emissions to surface water, groundwater and soil are detailed in the Construction Environmental Management Plan (CEMP) (*Enviroguide Consulting, 2022*).

12.2.5.5.2 Operational Phase

Once operational, the surface water drainage infrastructure for the Proposed Development will replicate natural characteristics by collecting the rainfall on the site and conveying the storm water run-off via roadside swales, rear garden filter drains, tree pits, bio retention areas, gullies, underground pipes, manholes, silt-traps and direct the flows via void arched attenuation systems and petrol towards vortex flow restricting devices, Hydrobrake or similar.

The overall surface water outfall rate from the Proposed Development has been restricted to the greenfield run off rate for the drained area. The surface water drainage design has been carried out in accordance with and in conjunction with the requirements of Dun Laoghaire Rathdown County Council's Drainage Department, Greater Dublin Regional Code of Practice, the Greater Dublin Sustainable Drainage System (GDSDS) and the CIRIA Report c753 "The SuDS Manual" 2015.

The Surface Water infrastructure has been divided into 2 catchment areas. One large (9.63 Ha drained area) and one small (0.29 Ha drained area). Surface water from the site of the Proposed Development will ultimately discharge to the Shanganagh River via settlement ponds that are part of the GDRS project. Due to hardstanding areas in the Proposed

Development, which will replace greenfield lands, the attenuation systems have been designed to provide sufficient capacity to contain and convey all surface water runoff associated with a 1 in 100-year event, plus an additional allowance of 20% to account for Climate Change and 10% to account for Urban Creep as per the GDSDS. The SuDS design will also incorporate best practice for improved flow control and quality of water discharged to the receiving waters, in particular the Shanganagh River.

The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments) in surface water runoff from roads and the impermeable areas. Given the design of the surface water management strategy for the Proposed Development and the implementation of SuDS features, it is considered that there be an overall neutral, imperceptible, long-term impact on the receiving surface water quality of the Shanganagh River.

12.2.5.6 Water Supply and Demand

12.2.5.6.1 Construction Phase

Site offices and construction activities will create a demand for water supply to the site. A temporary connection is required to facilitate on-site works for all housing developments. Commencement of construction will therefore result in a net increase in the water demand for the Site of the Proposed Development.

The Proposed Development will be connected to the existing mains water supply adjacent to the Site. Irish Water (IW) issued a Confirmation of Feasibility (COF) (Ref.CDS20006509 dated 30th May 2022) that both water supply connections from the Site are 'feasible without infrastructure upgrade by Irish Water'. Subsequently, a full design submission was made for the water infrastructure and IW have issued the Statement of Design Acceptance (SODA) letter (Ref.CDS20006509 issued on the 1st June 2022) (refer to Appendix 12.16 of the Engineering Infrastructure and Stormwater Impact Assessment Report, Roger Mullarkey & Associates, 2022). Water supply infrastructure at the Proposed Development will be designed and constructed in accordance with current IW Code of Practice for Water Infrastructure (Roger Mullarkey and Associates, 2022).

Some local diversions may be required to water supplies to accommodate the construction works which may require temporary outages. Additionally, new connection works may cause water supply disruptions during the Construction Phase. These disruptions will be controlled by Irish Water and DLRCC in accordance with standard protocols. Due to the nature of the works during the Construction Phase, the likely effect will be negative, not significant and temporary.

12.2.5.6.2 Operational Phase

During the Operational Phase of the Proposed Development there will be a demand for water from the public water supply. The mains water supply is operated in accordance with relevant existing statutory consents. The full calculations for the water demand for the Proposed Development are set out in Appendix 12.18 of the Engineering Infrastructure and Stormwater Impact Assessment Report (Roger Mullarkey & Associates, 2022), and are calculated as per Section 3.7.2 of the IW Code of Practice for Water Infrastructure. The calculations estimate that the 383 residential units of the Proposed Development will have an average daily water

usage demand of approximately 1.80 litres/sec (l/s). Commercial daily water usage demand in the commercial units (retail, medical, office and creche) has been calculated using the area of the commercial units, estimating 1 person per 5m^2 in the retail units and 1 child per 8m^2 in the creche plus 20% for staff, with a per capita consumption rate of 50 litres per head per day averages at approximately 0.69 l/s. Peak hour water demand has been estimated at 11.2 l/s and 2.4 l/s for the residential and commercial sections, respectively. Irish Water have confirmed that, based on a desk top analysis of the capacity currently available in the IW network(s) as assessed by IW, the proposed demand can be facilitated. Excess usage is the consumption of water services above the threshold amount stipulated in the Water Services Act (2017). Water use above the annual household allowance (213m^3) is considered to be excessive use and Irish Water customers may be liable for charges on the amount above this level.

In accordance with best practice, water conservation appliances are to be incorporated as part of the Proposed Development to reduce the water demand, including water saving tap valves, eco-flush toilet system and water saving appliances. Each dwelling will be fitted with a cold-water storage tank to provide 24 hours of supply, and it is proposed to provide 200l rainwater butts to the rear of each gabling property. This will collect rainwater from the house roofs for use in garden irrigation, therefore reducing drinking water demand and decreasing run-off from the site.

The likely effect of the increase in mains water demand will be neutral, not significant, and long-term on mains water supply.

12.2.5.7 Wastewater management

12.2.5.7.1 Construction Phase

A temporary connection is required to facilitate on-site works for all housing developments. Commencement of construction will therefore result in a net increase in the wastewater produced at the Site of the Proposed Development. It will be the Main Contractor's responsibility to apply to IW for connections to the foul water drains to service the site toilets and canteen facilities during the Construction Phase.

IW issued a Confirmation of Feasibility (COF) (Ref.CDS20006509 dated 30th May 2022) that foul water connections from the Site are 'feasible without infrastructure upgrade by Irish Water'. Subsequently, a full design submission was made for the foul water infrastructure. IW have issued the Statement of Design Acceptance (SODA) letter (Ref.CDS20006509 issued on the 1st June 2022) (refer to Appendix 12.16 of the Engineering Infrastructure and Stormwater Impact Assessment Report, Roger Mullarkey & Associates, 2022). The foul water drainage infrastructure at the Proposed Development will be designed and constructed in accordance with current IW Code of Practice for Wastewater Infrastructure which requires individual connections to each dwelling (Roger Mullarkey and Associates, 2022).

The wastewater connection for the Proposed Development will connect to the IW sewer network via Third Party infrastructure. Prior to the commencement of any Self-Lay Works, the Main Contractor will have to identify and procure transfer to IW of the arterial infrastructure within the Third-Party Infrastructure and demonstrate that the infrastructure complies with the requirements of the Irish Water Code of Practice and Standard Details and in that it is in adequate condition and capacity to cater for the additional load from the Proposed Development. The Proposed Development can be also connected to the proposed 225mm

gravity sewer on the future Glenamuck Link Distributor Road which will be delivered through Kilternan/Glenamuck Local Infrastructure Housing Activation Fund (LIHAF) Project (Engineering Infrastructure Report & Stormwater Impact Assessment, Roger Mullarkey & Associates, 2022).

Foul water sewer connections will be constructed strictly in accordance with IWrequirements and drains will be laid to comply with the requirements of the latest Building Regulations, and in accordance with the recommendations contained in the Technical Guidance Document H. The new connection works may cause disruptions to the foul water network during the Construction Phase. These disruptions will be controlled by IW and DLRCC in accordance with standard protocols. Due to the nature of the works during the Construction Phase, the likely effect will be negative, non-significant and temporary.

12.2.5.7.2 Operational Phase

The majority of the Proposed Development's wastewater drainage system (10.5 Ha of development land) will connect into the existing piped infrastructure in the Rockville Phase 2b development (DLR Reg. Ref. D18A/1191), which currently outfalls c. 430 metres downstream into the Irish Water drainage infrastructure on Glenamuck Road. Additionally, 0.3 Ha of development land (apartment Blocks C & D) will outfall into the piped infrastructure to be constructed as part of the Glenamuck District Roads Scheme (GDRS) on Glenamuck Road along the northern boundary of the site of the Proposed Development. The foul drainage connection spur from the GDRS infrastructure has been agreed with the DLRCC GDRS project office and is incorporated into that road project.

The full calculations for foul water flows from the Proposed Development are set out in Appendix 12.18 of the Engineering Infrastructure Report & Stormwater Impact Assessment (Roger Mullarkey & Associates, 2022). The calculations have been performed in line with the IW Code of Practice for Wastewater Infrastructure (2020). Domestic wastewater loads have been calculated based on 383 residential units housing 2.7 persons per unit with a per capita wastewater flow of 150 litres per head per day. A peak flow multiplier of 3 was used in the residential calculations. The resulting total dry weather foul water flow from the residential section of the Proposed Development is 1.97 l/s, with a peak flow of 6 l/s. Commercial wastewater loads have been calculated using the area of the commercial units, estimating 1 person per $5m^2$ in the retail units and 1 child per $8m^2$ in the creche plus 20% for staff, with a per capita wastewater flow of 50 litres per head per day. A peak flow multiplier of 6 was used in the residential calculations. The resulting total dry weather foul water flow from the commercial units of the Proposed Development is 0.62 l/s, with a peak flow of 3.76 l/s.

Capacity within the existing foul sewer network has been confirmed by Irish Water (*Appendix 12.16, Engineering Infrastructure Report & Stormwater Impact Assessment, Roger Mullarkey & Associates, 2022*). The foul water from the Proposed Development will ultimately be treated at Shanganagh-Bray Wastewater Treatment Plant (WwTP) prior to discharge to Killiney Bay. The Shanganagh WwTP is currently operating at under its capacity of 186,000 PE, with a current peak week loading of 129,335 PE. The increase in wastewater being discharged to the public sewer will have a neutral, non-significant, and long-term impact on the capacity of the public foul sewer or the WwTP.

12.2.5.8 Waste Management

12.2.5.8.1 Construction Phase

The majority of waste arising during the Construction Phase will comprise soil and stone materials associated with the excavation works required for foundations and connections to utilities and services. There will be demolition waste associated with the demolition of the existing structures on site comprising derelict farmyard buildings. A member of the construction team will be appointed as the Waste Officer to ensure commitment, operational efficiency and accountability during the Construction Phase of the Proposed Development.

The waste streams that will be generated by Construction and Demolition (C&D) activities are as follows:

- Demolition waste from the existing derelict farmyard buildings
- Topsoil and subsoil
- Packaging and general waste from construction activities
- General site clearance waste including tree stumps
- Municipal waste generated by workers

These wastes are as defined in the Construction and Demolition Waste Management Plan (CDWMP) (*Enviroguide Consulting, 2022*), which is submitted as a separate document with this planning application. All waste generated during the Construction Phase will be segregated on-site to enable ease in re-use and recycling, wherever appropriate. Material will be segregated on-site for the appropriate waste stream and disposal destination. The Waste Officer or appointed delegate will ensure waste streams are adequately identified. The segregation and management of waste storage and stockpiling will be routinely inspected and audited by the Waste Officer. In general, the priority of the CDWMP will be to promote recycling, reuse and recovery of waste and diversion from landfill wherever possible. This will be also managed in accordance with the principles set out in the CEMP (Enviroguide Consulting, 2022).

After in-situ reuse and recycling options have been fully considered, all residual waste streams will be collected by appropriately authorised waste collection contractors and will be managed using suitably permitted/licensed waste disposal or materials recovery facilities.

The total volume of topsoil and sub-soil to be excavated has been calculated at 72,500m^3. Of this, 31,650m^3 will be retained on site and will be reused as fill material and for landscaping. The total volume of topsoil and subsoil to be exported off-site has been calculated as 40,850m^3. The disposal of such material will occur on a phased basis thereby reducing any potential effects on the surrounding road network. All material to be disposed of offsite will be transported to a licensed waste disposal facility.

Due to the use of permitted/licensed waste collection/waste management facilities, it is not predicted that the production of waste will cause any likely significant effects on the environment. It is the responsibility of the Main Contractor to ensure that waste collection contractors are legally permitted to carry the waste, and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Acts 1996-2005.

12.2.5.8.2 Operational Phase

Enviroguide Consulting have prepared a Preliminary Waste Management Capacity Report (2022) and an Operational Waste Management Plan (2022) for the Proposed Development. The OWMP contains full details of the types and quantities of waste that may arise at the Proposed Development. The predicted waste types that will be generated at the residential dwellings in the Proposed Development include the following:

- Mixed Municipal Waste (MSW) / General Waste
- Dry Mixed Recyclables (DMR) - includes cardboard, plastic packaging, aluminium cans, tins, paper, and Tetra Pak cartons
- Organic (food) waste, and
- Glass – bottles and jars.

In addition to the typical waste materials that will be generated on a daily basis, there will be some additional waste types generated in small quantities that will need to be managed separately including:

- Bulky wastes – including furniture, carpets, mattresses
- Waste electrical and electronic equipment (WEEE)
- Batteries
- Textiles – clothes or soft furnishings
- Light bulbs or fluorescent tubes
- Chemicals – old medicines, paints, detergents, and
- Waste oil.

The Commercial Units (creche, office, medical, retail) and the Community Area will generate similar waste types to domestic waste types:

- Dry mixed recyclables
- Mixed Municipal (non-recyclable)
- Organic (food) waste, and
- Glass

with some additional commercial “office” type wastes such as paper and printer ink, batteries, and waste electrical and electronic equipment (WEEE). An additional lockable, colour coded, hazardous waste storage area will be provided for medical waste from the medical unit which will be managed and accessed by medical personnel only.

The List of Waste (LoW) code (previously referred to as European Waste Code or EWC) for typical waste materials expected to be generated during the operation of the Proposed Development are provided in Table 12-75.

Table 12-75 Expected Waste Types and List of Waste Codes

Waste Description	List of Waste Code
Mixed Municipal Waste	20 03 01
Mixed Dry Recyclables	20 03 01
Biodegradable Kitchen Waste	20 01 08
Glass	20 01 02
Bulky wastes	20 03 07
Waste electrical and electronic equipment*	20 01 35* 21 01 36
Batteries and accumulators*	20 01 33* 20 01 34
Textiles	20 01 11
Fluorescent tubes and other mercury containing waste*	20 01 21
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.)*	20 01 13/19/27-28/29-30
Plastic	20 01 39
Metals	20 01 40
Paper and Cardboard	20 01 01

**Individual waste type may contain hazardous materials*

The waste storage capacity requirements for the apartment and duplex buildings has been calculated in the OWMP, based on the number of units and the number of bedrooms in each unit. With waste collections occurring on a weekly basis, it is anticipated that 30 no.1,100L bins and 31 no. 240L bins (or equivalent) will be required in the waste storage areas – 12 no. 1,100L bins for mixed municipal waste, 18 no. 1,100L bins for dry mixed recyclables, 16 no. 240L bin for organic/food waste and 15 no. 240L bin for glass.

The OWMP notes that the total number of bins that will be provided is 37 no. 1,100L bins, which exceeds the required capacity for weekly collections. On this basis, the bin storage capacity comfortably allows for weekly collections and leaves adequate contingency to increase collection frequency should that be required during unusually high-volume periods such as Christmas. All collections must take place in compliance with conditions of the waste contractor's Waste Collection Permit for the region and in line with the Local Authority by-laws and the Waste Management (Waste Collection Permit) Regulations 2007 as amended. All residents are obliged by law to avail of the waste management service and must comply with local By-Laws and Statutory Instruments in relation to the presentation of waste for collection. Waste collections for a three-bin system service will be available from the time of first occupancy (i.e., even if all dwellings are not occupied).

A number of bin compound areas have been allocated for the apartment and duplex residents. It will be the responsibility of the residents to bring their segregated waste to the bin compound

and place into the appropriately labelled bins. Each bin will be clearly labelled to identify what wastes can and cannot be placed in the bin and labels will be pictorial. The route to the bin compound area and the area itself will be wheelchair accessible, adequately lit and appropriately ventilated.

Residents will be required to suitably store other waste materials that may be generated infrequently (such as bulky waste, textiles, printer toner/cartridges, WEEE, batteries and other household hazardous wastes) within their own dwellings and dispose of them appropriately at bring centres or civic amenity facilities. Ballyogan Recycling Park is located 1km northeast of the Site and bring banks are available at Stepaside Public Golf Course, approx. 950m north of the Site. All occupants will be supplied with information by the Management Company on the location of recycling facilities in the area.

The calculation for typical weekly waste arisings and subsequent storage requirements for commercial units is as follows:

Volume Per M_2 Of Sales Area [10 L] × Sales Area

Based on weekly waste collections, it is anticipated that 20 no. 1,100L bins and 20 no. 240L bins (or equivalent) will be required in the waste storage areas as detailed in Table 12-7 below. The frequency of bin collections can be increased as required, and individual bin requirements can be adjusted once the overall bin capacity is met at a minimum.

Table 12-76 Breakdown of Bin Numbers & Capacity for weekly Collections (Commercial Units)

		Food Waste	Glass	Dry Mixed Recyclables	Municipal Waste	Total Capacity Provided (L)
Description	**M^2**	**No. of 240L Bins**	**No. of 240L Bins**	**No. of 1100L Bins**	**No. of 1100L Bins**	
Creche	438	2	2	2	1	4,260
Office	317	1	1	2	1	3,780
Medical*	157	1	1	1	1	2,680
Retail	916	4	2	4	3	9,140
Retail	431	2	2	2	1	4,260
Community Area	274	1	1	1	1	2,680

*An additional lockable, colour coded, hazardous waste storage will be provided for medical waste which will be managed and accessed by medical personnel only.

By implementing the actions outlined in the OWMP, a high level of recycling, reuse and recovery will be achieved at the development in line with European targets. The source segregation of waste types as detailed in the OWMP will also help to achieve the targets set out in the Eastern-Midlands Region Waste Management Plan 2015-2021. Additionally, the design of the waste storage area will meet the requirements as detailed in the Department of Housing, Local Government and Heritage's 2021 publication, Sustainable Urban Housing, Design Standards for New Apartments.

In the absence of mitigation, the potential impact from the Operational Phase on municipal waste disposal is likely to be long term, negative and moderate.

12.2.5.9 Potential Cumulative Impacts

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and Proposed Developments was completed as part of this assessment.

Pre-planning consultation with DLRCC in relation to the GDRS project resulted in meetings and discussions been held with the GRDS consultant engineers (DBFL) to discuss any interface between the roads project and this subject application, with specific attention to drainage services and access arrangements.

It was clarified by DLRCC’s consultants that the GDRS scheme would provide capacity within their design to cater for the Kilternan Village lands. Furthermore, agreement was made with DLRCC project office to facilitate drainage connections subject to a successful planning application. It was confirmed by DLRCC consultants that GDRS infrastructure has been designed to cater for the attenuated run-off from the Kilternan Village lands and that the regional pond in that project has capacity to intercept and store the surface water outfall from the site of the Proposed Development. Correspondence relating to the above interface is included in Appendix 12.17 of the Engineering Infrastructure Report & Stormwater Impact Assessment (Roger Mullarkey & Associates, 2022).

There are several existing, proposed and granted planning permissions on record in the area ranging from small-scale extensions and alterations to existing residential properties to some larger-scale developments. Table 12-77 details the Planning Applications at Rockville located to the north-east of the subject Site. Table 12-78 details the existing, proposed and granted planning permissions on record in the area:

Table 12-77 Summary of Potential Cumulative Impacts with Planning Applications at Rockville

Planning Ref No.	Location	Summary of Development
D20A/0015 Decision: Grant Permission subject to 19 no. conditions Date: 06 Mar 2020	Site located to the southeast of Glenamuck Road South, Kiltiernan, Dublin 18	Permission for a Phase 2B residential development. The application site is located to the southeast of the Phase 1 residential development permitted under Reg. Ref.: D17A/0793 which is currently under construction. The Phase 2B proposal relates to the construction of a four-storey apartment block comprising of 56 no. residential units including 11 no. 1 beds, 39 no. 2 beds and 6 no. 3 beds. The apartment block includes a gym facility with GFA of 50.6 sqm a creche facility with GFA of 126 sqm, both at ground floor level, and private, communal and public open space. The proposed includes a homezone access and parking area containing 72 no. surface parking spaces, cycle parking spaces, including bike stores, and bin stores. The proposal includes all associated site works, including internal access roads, cycleways and footpaths, drainage, hard and soft landscaping and boundary treatment. The Proposed Development will connect to the infrastructure and services in the permitted Phase 1 residential development to the northwest and provide for future connections to other adjoining lands.
D18A/0566 (amended by D18A/1191) (Addition to the residential development permitted under Reg. Ref: D17A/0793 below) Decision: Grant Permission subject to 26 conditions Date: 02 October 2018	Lands south of Rockville House, Glenamuck Road South, Kiltiernan, Dublin 18	Phase 2A of Rockville: Construction of 6 no. four-bed houses on a site south of Rockville House, with building heights of 2.5 no. storeys. The development will be accessed from the permitted local road within the adjoining the residential development to the north. The proposal is a small addition to the residential development permitted under Reg. Ref.: D17A/0793 for 49 no. Units (37 no. dwellings and 12 no. apartments) and will be accessed from the permitted local road within the adjoining the residential development to the north. The proposed residential units are as follows: 3 no. House Type D1 - 2.5 storey 4 no. bed semi-detached dwelling (c.163. 5sq.m) House Type D2 - 2.5 storey 4 no. bed terraced dwelling (c.146.2 sq.m) House Type D3 - 2.5 storey 4 no. bed terraced dwelling (c.137.7 sq.m) House Type D4 - 2.5 storey 4 no. bed semi-detached dwelling (c.137.7 sq.m). Each residential unit is provided with 2 no. curtilage car parking spaces and private gardens which ranged from c.75-84 sqm. Under DLR Reg. Reg. D18A/1191, an amendment application was submitted, which sought a change of house types only. Permission was granted by the Planning Authority on 19th February 2019, which was subject to a Third-Party Appeal to An Bord Pleanála (ABP-303871-19). Permission was ultimately granted on 24th June 2019 subject to 11 No. conditions.
D17A/0793* Decision: Grant Permission (subject to 38 no. conditions) Date: 25 January 2018	Lands south of Rockville House, Glenamuck Road South, Kiltiernan, Dublin 18	This development will be the first phase of development on the residential zoned lands at Rockville House. Demolition of existing agricultural outbuildings on site; Retention of Rockville House to provide for 2 No. separate residential dwellings. Construction of a total of 49 No. dwellings consisting of 37 No. detached, semi-detached and terraced 2/3 storey houses and 12 No. apartments. The apartments will be provided within 1 no. four storey apartment block. Provision of 95 No. car parking spaces and a new vehicular access from Glenamuck Road South.

**Note: Development works have been completed. Therefore, there are no potential cumulative impacts. This development has been considered within the baseline assessment for the Proposed Development*.

Table 12-78: Summary of Potential Cumulative Impacts with additional Planning Applications in the Area

Planning Ref. No.	Location	Summary of Development
ABP-309846-21 Grant Permission subject to 26 No. conditions Date: 15 July 2021	Enniskerry Road SHD, Adjoining Bishop's Gate Housing Development	203 No. residential units (109 No. houses, 94 No. apartments) and a creche. The heights range from 2 to 3 No. storeys. Vehicular access serving the Proposed Development primarily via the existing junction off Enniskerry Road serving the Bishops Gate development.
ABP-307043-20 Grant Permission subject to 28 No. conditions Date: 28 August 2020	Suttons Fields, Ballybetagh Road, Kilternan Village, Dublin 18	Permission for a strategic housing development consisting of 116 dwellings and creche. The dwellings will comprise: 85 No. houses and 31 No. apartments. The buildings will range from 1-3 No. storeys in height. The development will include a Main Road on its west boundary, running from Ballybetagh Road to the north boundary, that will facilitate linkage to development lands to the north. Pedestrian and cycle access will be provided from Ballybetagh Road into the site, along the west boundary of Our Lady of the Wayside National School, connecting to the site circulation roadway in the vicinity of the childcare unit
ABP-306160-19 Grant Permission subject to 31 No. conditions Date: 06 April 2020	Glenamuck Road, Enniskerry Road, Kiltiernan, Dublin 18	1) The demolition of 2 No. habitable dwellings on the site - 'Greenmount' (195 sq m) and 'Dun Óir' (345 sq m inclusive of ancillary buildings); 2) i) the construction of a 197 No. unit residential development comprising: 62 No. houses and 115 No. apartments in 7 No. blocks ranging in height from 3 to 4 No. storeys, and 20 No. duplex apartments in 4 No. three storey blocks; (ii) a 275 sq m crèche; (iii) the construction of the link access road between Enniskerry Road and Glenamuck Road required under the Kilternan/Glenamuck Local Area Plan 2013 including vehicular access points onto Enniskerry Road and Glenamuck Road.
ABP-303978-19 Grant Permission subject to 31 No. conditions Date: 26 June 2019	Glenamuck Road, Enniskerry Road, Kiltiernan, Dublin 18	203 residential units within 12 No. blocks ranging in height from 3-6 No. storeys). The provision of a creche, a retail unit and a social/amenity facility. The development will include a new access from Glenamuck Road and the provision of access connection points, vehicular, cycle and pedestrian) to future adjacent development lands.

The Proposed Development will increase the impact on the existing Material Assets. Having regard to other permitted developments in the area, which are either under construction or where construction has not yet commenced, there is potential for greater impact arising from the demand of additional population living in the area.

ABP-307043-20 – A Construction and Waste Management Plan has been prepared by Donnelly Troy & Associates which details control and mitigation measures to ensure there is no significant impact on the local community and infrastructure during the Construction Phase. This includes measures relating to dust, noise, vibration and health and safety. Therefore, there are no cumulative impacts anticipated with this development.

ABP-306160-19 – An Outline Construction Environmental Plan prepared by Atkins features a number of mitigation measures for the Construction Phase to ensure there will be no significant impacts on air quality, dust, hydrology or noise and vibration. Therefore, there are no cumulative impacts anticipated with this development.

ABP-303978-19 – An Environmental Impact Assessment Screening Report prepared by MacCabe Durney Barnes concluded that possible effects on the environment are not considered significant. The Construction Management Plan prepared by Corrigan Hodnett Consulting also details environmental management measures to prevent significant impacts as a result dust, dirt, noise and vibration.

As detailed in Table 12-77, aside from the development at Rockville, planning permission has been granted for 719 no. residential units (under 4 no. separate planning applications), 3. No creches and additional retail units in the vicinity of the site of the Proposed Development.

Accordingly, surrounding permitted development, when considered cumulatively with the Proposed Development, will result in a permanent impact on the receiving networks and services, including foul and surface water disposal, potable water supply, natural gas supply, electrical supply, telecoms and waste however, the impact is considered to be not significant having regard to the capacity of services.

12.2.5.10 "Do Nothing" Impact

If the Proposed Residential Development is not advanced, the site will remain as a greenfield area with playing pitches, grazing fields, hedgerows and a derelict farmyard area. However, if the lands were to remain undeveloped, this would be an under-utilisation of zoned and serviceable urban lands from a sustainable planning and development perspective, particularly considering the location of the lands, and the potential for the land to be developed into a new Neighbourhood Centre.

Due to the size of the Site of the Proposed Development in relation to other areas of land zoned for residential development in the environs, it is considered that the housing targets for the settlement set out in the Kilternan Local Area Plan (extended to 2023) and the Kilternan Neighbourhood Framework Plan (2010) could not be achieved, and a Do-Nothing scenario could potentially result in a continual decline of the population of the area.

12.2.6 Avoidance, Remedial & Mitigation Measures

Specific avoidance, remedial and mitigation measures will be required for the Proposed Development. The measures that will be taken to ensure that there will be no significant impact on the surrounding Material Assets during the Construction Phase include:

Waste will be stored onsite in such a manner as to:

- Prevent environmental pollution.
- Minimise nuisance generation such as dust.
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling, and recovery.

In the event that hazardous soil, or historically deposited waste is encountered during the site bulk excavation phase, the contractor will notify DLRCC and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the proposed authorised waste collector(s). According to the CDWMP, it is anticipated that there will be no asbestos containing materials (ACMs) generated during the Construction Phase of the Proposed Development. If ACMs are identified on site at a later stage, a full asbestos report will be carried out. Removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACM's will only be removed from site by a suitably permitted/licenced waste contractor in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.

Additionally, a Construction Environmental Management Plan will be in effect for the full duration of works. The Health and Safety Authority's "Code of Practice for Avoiding Danger From Underground Services" will be followed during construction and excavation activities and all underground and overhead utilities and public services will be identified and protected during the Construction Phase. All temporary suspensions to public services will be controlled by the relevant statutory undertaker, in accordance with standard protocols and all services will be reinstated as soon as possible post connection. Potable water networks and foul water sewers will be properly tested prior to connection.

12.2.6.1 "Worst Case" Scenario

In the event that the Proposed Development was to proceed, a worst-case scenario in relation to built services & infrastructure (electricity, telecommunications, gas, water supply infrastructure, and sewerage), would be where the works involved during construction resulted in an extended power or telecommunications outage, or disruption to water supply or sewerage systems for existing properties in the area due to unforeseen delays on site.

A worst-case scenario in relation to waste would be where a previously unclassified hazardous waste stream arose on the site during excavations, which was not identified and segregated appropriately and resulted in the contamination of a non-hazardous waste stream, such as soil and stones, resulting in a large volume of hazardous waste that would require specialist removal and treatment. Additionally, the contaminated soil and stones would no longer be fit for use for fill and landscaping and would need to be replaced with imported materials.

However, taking account of the avoidance and mitigation measures, the worst-case scenarios are deemed to be an unlikely scenario.

12.2.7 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures'. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

Having regard to the mitigation measures proposed within this and other Chapters of the EIAR, no significant residual impacts are anticipated.

12.2.8 Monitoring

12.2.8.1 Construction Phase

The monitoring of C&D waste during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the Site boundary. The Main Contractor will be responsible for monitoring and record keeping in respect of waste leaving the facility and that these records will be maintained on site.

12.2.8.2 Operational Phase

The building management company, residents, tenants, retail units and creche operators will be required to maintain the bins and storage areas in good condition as required by the DLRCC Waste Bye-Laws. The waste strategy presented in the OWMP will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy. The areas will be fitted with CCTV for monitoring.

12.2.9 Interactions

The Proposed Residential Development will provide additional housing in a densely populated suburban area. Material assets, utilities and waste interact with other environmental receptors as follows:

- Population and Human Health: The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Potential impacts on population and human health are addressed in Chapter 4 of this EIAR.
- Biodiversity: The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5 (Biodiversity) of this EIAR.
- Land and Soil: Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the site. Potential impacts on land and soils are addressed in Chapter 6 of this EIAR.
- Water (Hydrology & Hydrogeology): Any connections to the public water network (water supply or foul sewer) during the Construction and Operational Phases will be under consent from Irish Water. Potential impacts on water are addressed in Chapter 7 of this EIAR.

- Traffic: Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the Kilternan area. Potential impacts on traffic are addressed in Chapter 12.1 of this EIAR.

12.2.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter.

12.2.11 References

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

Glenamuck District Roads Scheme Environmental Impact Assessment Report Volume 2: Main Report (March 2019) (viewed online 20.01.2022)

https://www.gov.ie/en/publication/5634d-national-broadband-plan-map/#interactive-map (viewed online 21.01.2022)

https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=9def898f708b47f19a8d8b7088a100c4 (19.01.2022)

https://www.dlrcoco.ie/sites/default/files/atoms/files/Chapters_1-10.pdf

https://www.dlrcoco.ie/sites/default/files/atoms/files/Chapters_11-20.pdf

https://www.dlrcoco.ie/sites/default/files/atoms/files/kiltiernan_appendixa1.pdf

https://www.dlrcoco.ie/sites/default/files/atoms/files/kiltiernan_appendixa2.pdf

Kilternan Neighbourhood Framework Plan (January 2010) (dlr Architects Department dlr Planning Department) (viewed online 20.01.2022)

13 RISK MANAGEMENT

13.1 Study Methodology

13.1.1 Scope and Context

The relevant legislation that applies to this Chapter is the Planning and Development Regulations 2001 as amended, and in particular Schedule 6 – Information to be contained in EIAR. The following paragraph of Schedule 6, Paragraph 2(e)(i)(IV), specifically refers to "*a description of the likely significant effects on the environment of the proposed development resulting from … the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)*".

Paragraph 2(h) further expands with "*a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events*."

Additionally, the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), which implement the Seveso III Directive (2012/18/EU), and which revoked the 2006 Major Accident Regulations also applies to this Chapter.

This Chapter was prepared by Enviroguide Senior Environmental Consultant Nikita Coulter. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation and a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

13.1.2 Guidelines and Reference Material

Cognisance has been taken of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). This document follows the requirements laid out in the Directive 2014/52/EU.

Specifically, the EPA Guidelines state that the EIAR must take account of "*the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk)… The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with sensitive plants. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment*

may be required. The EIAR should refer to those separate assessments while avoiding duplication of their contents."

Reference has also been made to the Department of the Environment, Heritage & Local Government (DoEHLG) Publication 'Guide to Risk Assessment in Major Emergency Management 2010' and the Office of Emergency Planning, Department of Defence (DOD) Publication 'A National Risk Assessment for Ireland 2020'. A consolidated list of national hazards for Ireland identified in the DOD document are identified in Table 13-1.

Table 13-1 Consolidated List of National Hazards (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

Hazard: Civil	**Hazard: Natural**
• Large Crowd Event • Pandemic • Water Supply Distribution and Contamination • Food Chain Contamination • Animal Disease • Terrorist Incident	• Storm • Snow and Ice (Including prolonged low temperature) • Flooding (Including pluvial, fluvial and coastal)
Hazard: Transportation	**Hazard: Technological**
• Maritime Incident • Air Incident • Transport Hub (Includes Airports, Ports and Rail Stations)	• Structural Collapse (Including Dam, Tunnel, Bridge and Building) • Nuclear Incident (Abroad) • Cyber Incident • Disruption of Energy Supply (Including oil, gas, electricity and communications)

13.1.3 Risk Assessment Methodology

The risk assessment methodology has been supported by general risk assessment methods. Hazard analysis and risk assessment are accepted internationally as essential steps in the process of identifying the challenges that may have to be addressed by society, particularly in the context of emergency management. Mitigation as a risk treatment process involves reducing or eliminating the likelihood and/or the impact of an identified hazard.

Table 13-2 Classification of National Likelihood Criteria (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

National Likelihood Criteria		
Rating	**Classification**	**Average Recurrence Interval**
1	Extremely Unlikely	100 or more years between occurrences
2	Very Unlikely	51-100 year between occurrences
3	Unlikely	11-50 years between occurrences
4	Likely	1-10 years between occurrences
5	Very Likely	Ongoing/Less than 1 year between occurrences

13.2 Predicted Impacts

The EIAR Chapters within this report identify that the Proposed Development has been designed in accordance with best practice and that the Proposed Development can be safely undertaken without risk to health.

In order to understand the potential consequences and predicted impacts of any major accident or disaster due to the Proposed Development and the vulnerability of the project a desk study was undertaken. The assessment reviewed:

- The vulnerability of the project to major accidents or disasters.
- The potential for the project to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology has been used including the following phases:

Phase 1 Assessment:

The DOD Consolidated List of National Hazards was used to identify a preliminary list of potential major accident and disasters. Receptors covered by legislation were not included within the assessment e.g. construction workers.

Phase 2 Screening:

The list was screened and major events such as volcanoes were not included given the unlikely event of one occurring. Elements already addressed as a key part of the design e.g. risks of building collapse, are not repeated.

Phase 3: Mitigation and Evaluation

In the event that mitigation measures included did not mitigate against the risk, then, the potential impacts on receptors are identified in the relevant Chapter. Table 13-3 lists the major accidents and/or disasters reviewed.

Table 13-3: Major Accidents and/or Disasters Reviewed

Major Accident or Disaster	Relevant for this Proposed Development? (Y/N)	Why relevant?	Potential Receptor	Covered within EIAR?
Civil				
Large Crowd Event (An event with over 5,000 people)	N	Not considered vulnerable due to the nature of the Proposed Development, i.e., predominantly residential development and neighborhood development.	N/A	N/A
Pandemic	Y	COVID-19 is an illness that can affect your lungs and airways. It is caused by a virus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). SARS-CoV-2 is spread in sneeze or cough droplets. The Proposed Development poses no additional COVID-19 risk. It is anticipated that there will be approximately 100 workers directly employed during the Construction Phase of the project. During the Construction Phase of this Proposed Development HSE guidelines will be adhered to as relevant. All workers directly and indirectly employed during the Operational Phase of the Proposed Development will comply with the relevant Government protocols that will be in place at that point in time in relation to COVID-19.	Local businesses, construction workers	Chapter 4 (Population and Human Health) of this report addresses COVID-19.

Water Supply Distribution and Contamination	N	Waterborne diseases can be caused by consuming contaminated drinking water. No public health issues have been identified for the Construction Phase or Operational Phase of the Proposed Development. Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers associated with the dewatering works. The existing water supply for the Proposed Development will be via connection to the public supply.	Local water users	Chapter 7 (Water (Hydrology and Hydrogeology)) of this report identifies the control measure required to avoid contamination of water supplies during construction works.
Food Chain Contamination	N	Potentially relevant to the Proposed Development in the Operational Phase. The creche unit and any food retail units will be required to register with the HSE and would need to adhere to food safety legislation and traceability requirements.	N/A	N/A
Animal Disease	N	Not relevant to the Proposed Development	N/A	N/A
Terrorist Incident	N	Not considered vulnerable due to the nature of the Proposed Development, i.e., residential/commercial development.	N/A	N/A
Transportation				
Maritime Incident	N	Not considered vulnerable. The site of the Proposed Development is approximately 5.25km from the coast.	N/A	N/A
Air Incident	N	Not considered vulnerable. The closest commercial airport is Dublin Airport, which is approximately 20km north of the site of the Proposed Development. The closest domestic airport is Weston Airfield, which is located approximately 23.5km northwest of the site of the Proposed Development. Casement Aerodrome, Baldonell is a military airbase located approximately 18km west-northwest of the site of the Proposed Development.	N/A	N/A
Transport Hub (Includes Airports, Ports and Rail Stations)	N	Not considered vulnerable. The closest rail station is Shankill Train Station, which is approximately 5km east of the Site of the Proposed Development.	N/A	N/A

		The closest maritime port is Dun Laoghaire Port, which is approximately 7.5km northeast of the site of the Proposed Development. *For airports see above*.		
Natural				
Cultural, Archaeological and Architectural Heritage	N	Not considered vulnerable as no known archaeological, architectural or cultural heritage remains were found during the desk top survey.		Chapter 11 (Archaeology and Cultural Heritage) of this EIAR assessed the impact of the Proposed Development on the Archaeological and Cultural Heritage.
Landslides / Sinkholes / Earthquakes	N	Not considered vulnerable. The Geological Survey of Ireland (GSI) (2022) records indicate that the site of the Proposed Development is located within an area with a 'Low' landslide susceptibility classification, and there are no landslides at the Proposed Development site recorded on the GSI database (GSI, 2022). Sinkholes are most common in karst terrain. The Geological Survey of Ireland (2022) records for karst features indicate that there are no karst features within 2km of the Proposed Development site. The area is not seismically active.	N/A	Chapter 6 (Land and Soils) of this EIAR assessed the vulnerability of the Proposed Development to ground movements.
Floods/Storm surge/Tidal flooding	N	Not considered vulnerable. The Site-Specific Flood Risk Assessment concludes that the Proposed Development site is regarded to be of low flood risk and is suitable for development (Roger Mullarkey & Associates, May 2022).	N/A	A Site-Specific Flood Risk Assessment was conducted for the site. Chapter 7 (Hydrology) of this EIAR assesses the vulnerability of the project to flooding.
Severe weather such as Tornados, Heatwaves, Blizzards and Droughts	N	Not considered vulnerable. In the event of severe weather events, the national meteorological service, Met Éireann, provides advance notice of severe weather, usually several days in advance. When appropriate, colour-coded weather warnings are issued. The Office of Emergency Planning works with the government departments and other key public authorities in order to ensure the best pos-	N/A	N/A

		sible use of resources and compatibility across different emergency planning requirements.		
Air Quality events	N	Vehicular emissions Dust emissions	Residents/ workers	Chapter 8 (Air Quality) of this EIAR identifies the impact of the construction and operation of the development on ambient air quality.
Wildfires	N	Not considered vulnerable due to the location of the site of the Proposed Development.	N/A	N/A
Fire	Y	There is a risk of fire which might lead to loss of life and environmental pollution.	Residents / Employees / Members of the Public	Section 13.3 of this Chapter deals with Fire Safety and Emergency Response.
Invasive species	Y	No invasive species were recorded on the site during site surveys. There is a risk of introducing invasive species to the Proposed Development. Any material required on the site will be sourced from a stock that has been screened for the presence of any invasive species by a suitably qualified ecologist and where it is confirmed that none are present. All machinery will be thoroughly cleaned and disinfected prior to arrival on site to prevent the spread of invasive species.	Native species / local biodiversity	Chapter 5 (Biodiversity) of this EIAR identifies the vulnerability of the project to invasive species.
Technological				
Structural Collapse (Building)	N	This has been taken into consideration in the building design. All buildings have been designed to modern standards. No further assessment is required.	N/A	N/A
Structural Collapse (Dam, Bridge, Tunnel failure)	N	Not considered vulnerable as no dams, bridges or tunnels are proposed as part of the development.	N/A	N/A
Flood defence failure	N	Not considered vulnerable No flood defence systems are included as part of the Proposed Development due to the low flood risk.	N/A	Chapter 7 (Hydrology) of this EIAR identifies the vulnerability of the project to flooding.
Nuclear incident	N	Not considered vulnerable. There are no nuclear power stations close to the Proposed Development.	N/A	N/A
Cyber incident	N	Not considered vulnerable This is a predominantly residential development; however, the	N/A	N/A

		retail/commercial units may opt to have cyber protection in place when operational. This will be at the discretion of the unit operators.		
Disruption to energy supply (oil, gas, electricity)	N	Not considered vulnerable. ESB Networks maintain the electricity network in Ireland. Gas Networks Ireland maintain the natural gas network in Ireland.	N/A	Chapter 12 (Material Assets) of this EIAR contains information on energy systems.
Utilities failure (communications)	N	Not considered vulnerable. In Ireland, the fixed-line communications market is dominated by Eir; while Eir, Three, and Vodafone own Ireland's mobile telecommunications infrastructure.	N/A	Chapter 12 (Material Assets) of this EIAR contains information on communications systems.
Utilities failure (water supply)	N	Not considered vulnerable. Irish Water have issued a Statement of Design Acceptance letter advising that the proposed connection to the Irish Water networks can be facilitated at this moment in time.	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on water supply
Utilities failure (wastewater, sewage)	N	Not considered vulnerable. Irish Water have issued a Statement of Design Acceptance letter advising that the proposed connection to the Irish Water networks can be facilitated at this moment in time and that there is capacity within the network to receive and treat foul effluent from the Proposed Development.	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on wastewater and sewage removal and treatment
Utilities failure (solid waste)	N	Not considered vulnerable. A Construction, Demolition and Waste Management Plan has been prepared for the Construction Phase of the Proposed Development and an Operational Waste Management Plan has been prepared for the Operational Phase of the Proposed Development. The implementation of the waste management plans will mitigate risks from solid waste.	N/A	Chapter 12 (Material Assets) of this EIAR contains information on solid waste removal and treatment
Industrial accidents (defence, energy, oil and gas refinery, food industry, chemical industry, manufacturing, quarrying, mining)	N	Not considered vulnerable. There are no Upper Tier Seveso sites adjacent to the site of the Proposed Development. There are 16 Upper Tier Seveso sites located approximately 11.5km north of the Proposed Development at Dublin Port.	N/A	N/A

13.3 Fire Safety and Emergency Response Plan

13.3.1 Construction Phase:

The site will be managed in accordance with the Construction Management Plan, the Construction Environmental Management Plan and the Construction Demolition Waste Management Plan, which will ensure that all hazardous and flammable substances on site will be segregated and stored appropriately. There will be no smoking allowed on site and all hot works will be subject to a work permit system.

13.3.2 Operational Phase:

The design criteria of the buildings are in accordance with all relevant building and fire safety standards. Smoke ventilation, fire alarms and emergency lighting will be fitted on all buildings and a sprinkler system will be fitted on the apartment buildings. A fire evacuation strategy will be put in place in advance of dwelling occupancy. The retail, commercial, office and medical units and the creche will also have protective services and evacuation strategies in place prior to occupancy. Access routes serving the Proposed Development have been designed to provide adequate space for the Fire Brigade.

13.4 Cumulative Impacts

The cumulative effects of Proposed Development on Major Accidents and Disasters have been assessed taking other planned, existing and permitted developments in the surrounding area into account. All planning permission applications that have been granted and developed have been incorporated into the baseline assessment of this application.

As noted in Table 13-3, the site of the Proposed Development is not an industrial site, and is not regulated, connected to or close to any site regulated under the COMAH Regulations. Additionally, there are no developments under construction or proposed in the in the vicinity of the site of the Proposed Development which will be regulated under the COMAH Regulations, and so there is no potential for cumulative impacts relating to major accidents involving dangerous substances.

All cumulative impacts have been detailed in the relevant technical chapters and are summarised in Chapter 15.

13.5 Residual Impacts

Through the implementation of mitigation measures detailed in the relevant technical chapters of this EIAR, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that would lead to significant residual impacts or environmental effects as a result of the Proposed Development, alone or in combination with other projects.

The residual impacts will be negligible once all control, mitigation and monitoring measures have been implemented.

13.6 Monitoring

All monitoring proposals for the risks identified in Table 13-3 have been detailed in the relevant technical chapters as listed in Table 13-3 and are included in Chapter 15 Mitigation Measures and Monitoring.

13.7 Difficulties Encountered When Compiling

No difficulties were encountered in completing this Risk Chapter.

13.8 References

- Chapter 4-12 of Volume 2 of this EIAR
- Environmental Resources Management Ireland Ltd (2005) Public Safety Zones Report
- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Garda Mapping Section – Seveso Sites Ireland WebMap [Viewed Online 03.05.2022] https://www.arcgis.com/home/item.html?id=a01b5a0a6ff24f10adff30beaa3b6fd0
- Office of Emergency Planning (2020) 'A National Risk Assessment for Ireland 2020' Department of Defence Publication
- Statutory Instrument (SI). No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018

14 INTERACTIONS

14.1 Introduction

As a requirement of Planning Regulations and the Environmental Protection Agency's '*Guidelines on information to be contained in Environmental Impact Assessment Reports'* (2022), interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant Chapters of this report. However, as with all developments that pose potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This Chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

The following Section is directed by Article 3 section 1(e) of the EIA Directive. The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022) and Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015) were also considered.

Article 3 of the Directive states:

1. The environmental impact assessment will 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)

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction and Archaeology and Cultural Heritage Chapters of EIARs.

14.1.1 Description of the Proposed Development

The Proposed Development (as detailed in Chapter 2 of this EIAR) comprises of:

The demolition of 573.2 sq m of existing structures on site comprising a derelict dwelling known as 'Rockville' and associated derelict outbuildings; and the provision of a mixed use development consisting of 383 No. residential units (165 No. houses, 118 No. duplex units and 100 No. apartments) and a Neighbourhood Centre, which will provide a creche (439 sq m), office (317 sq m), medical (147 sq m), retail (857 sq m), convenience retail (431 sq m) and a community facility (321 sq m). The 383 No. residential units will consist of 27 No. 1 bedroom units (19 No. apartments and 8 No. duplexes), 128 No. 2 bedroom units (78 No. apartments and 50 No. duplexes), 171 No. 3 bedroom units (108 No. houses, 3 No. apartments and 60 No. duplexes) and 57 No. 4 bedroom units (57 No. houses). The Proposed Development will range in height from 2 No. to 5 No. storeys (including podium/undercroft level in Apartment Blocks C and D and in the Neighbourhood Centre).

14.2 Study Methodology

The interactions between impacts on different environmental factors have been addressed throughout this EIAR. Close co-ordination and management with the EIAR team was carried out to ensure that all likely relevant interactions were addressed at the scoping stage of the EIAR, and interactions have been adequately assessed.

Following an assessment of the EIAR, a matrix was produced to display where interactions between impacts on different factors have been addressed. This has been carried out by use of Chapter headings included in the EIAR and details of any interaction during all phases of the Proposed Development.

14.3 Interactions

The following matrix has been produced to show where potential significant interactions between effects on different factors have been addressed, see Table 14-1.

As this EIAR has been prepared by a number of specialist consultants, an important aspect of the EIA process was to ensure that interactions between the various disciplines have been taken into consideration. The principal interactions requiring information exchange between the environmental specialists and the design team are summarised in Table 14-2 to Table 14-10.

Table 14-1: Interactions between Factors

Interaction	4. Population and Human Health	5. Biodiversity	6. Land and Soils	7. Hydrology	8. Air Quality & Climate	9. Noise & Vibration	10. Landscape & Visual Amenity	11. Archaeology, Architecture & Cultural Heritage	12. Material Assets – Waste & Utilities	12. Material Assets - Traffic
Population and Human Health										
Biodiversity										
Land and Soils										
Hydrology										
Air Quality and Climate										
Noise & Vibration										
Landscape & Visual Amenity										
Archaeology, Architectural and Cultural Heritage										
Material Assets – Waste & Utilities										
Material Assets - Traffic										

	No Interaction
	Interaction
	N/A

Table 14-2 Population and Human Health

Population and Human Health	
Summary	
Chapter 4 of this EIAR, *Population and Human Health,* details the direct and indirect effects of the Proposed Development on Population and Human Health; and sets out any required mitigation measures where appropriate. The population in the vicinity of the site of the Proposed Development has been assessed in terms of demography, economic activity and employment, tourism and amenity, landscape and visual, human health and social health.	
Interactions	
Land and Soil	The Construction Phase of the Proposed Development could give rise to short-lived dust from the site and from soil spillages on the existing road network around the site which may impact population and human health, especially during dry conditions. Dust control measures will be carried out to ensure that dust nuisance affecting population and human health and neighbouring properties is minimised. Good construction management practices, as detailed in the CEMP, will minimise the risk of pollution from construction activities at the Site. During the Operational Phase, due to best management practices, good housekeeping, and adherence to all health and safety procedures, it is not foreseen that there will be any negative impacts to population and human health.
Hydrology	There is potential for significant impacts between Population and Human Health with Hydrology and the water quality of the surrounding area. Pollution events can impact the water quality. Appropriate surface water and foul water control measures will be implemented as part of the Proposed Development. No public health issues associated with the water conditions at the Site have been identified for the Construction Phase or Operational Phase of the Proposed Development. Appropriate industry standards and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers. Hydrology has been fully assessed in Chapter 7 of this EIAR.
Air Quality and Climate	Interactions between Air Quality and Population and Human Health have been considered as the Construction and Operational Phase has the potential to cause health issues as a result of impacts on air

	quality, particularly dust emissions. The Air Dispersion Model carried out as part of the Traffic and Transport Assessment has determined that all emissions from the facility will not exceed their recommended emission limit values; therefore, human health shall not be adversely affected in this regard. Appropriate control and mitigation measures employed at the Proposed Development will ensure there will be no significant impacts in relation to air quality standards and human health.
Noise and Vibrations	Construction activities such as site clearance, building construction works, and trucks and vehicles entering and exiting the Site have the potential to interact with the surrounding population and human health. The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and last only for the duration of the Construction Phase. There will be no adverse impact on population and human health. The operational noise and vibration impact is not significant with a neutral effect. Noise is fully assessed in Chapter 9 of this EIAR.
Landscape and Visual	The Proposed Development will alter the visual appearance of the Site which currently contain a vacant dwelling and associated disused farm buildings. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the suburban and residential nature of the surrounding landscape, will cause any issues for the local residential population.
Material Assets: Waste and Utilities	The improper removal, handling and storage of hazardous waste has the potential to negatively impact on the health of construction workers. The Construction and Demolition Waste Management Plan (CDWMP) and CEMP (Enviroguide, 2022) details mitigation measures to ensure the safety of the workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health.
Material Assets: Traffic	Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of vehicles. There is potential for impacts on population and human health in relation to the capacity and operation of the surrounding road network. However according to Chapter 12.1 Traffic, the impact of development traffic is of the order of low in the case of the without GDRS to negligible when the GDRS is available.

Conclusions
The Proposed Development is considered to have a slight positive impact during both the Construction and Operational Phase of the development, both directly and indirectly, to the local economy and employment. Adverse impacts on Population and Human Health are not expected to occur and any potential interactions with impacts of other environmental aspects, as outlined in this EIAR, are insignificant.

Table 14-3: Biodiversity

Biodiversity	
Summary	
Chapter 5 of this EIAR, *Biodiversity,* details the direct and indirect effects of the Proposed Development on the local flora and fauna; and sets out any required mitigation measures where appropriate. Biodiversity interacts with several environmental factors including land & soils, hydrology, air quality, climate and microclimate and noise & vibrations Chapters of this EIAR. Changes to these environmental factors could result in significant impacts on biodiversity such as the interactions outlined below.	
Interactions	
Land & Soils	Interactions between soils & land and biodiversity can occur through the spread of any hazardous material/contaminated land which may occur during the construction stage. The spread of land contaminated with potentially hazardous material could result in habitat degradation of habitats within the Proposed Development site and adjacent/downstream designated sites and their associated qualifying interests. Following the implementation of measures outlined within the Outline Construction Management Plan (OCMP), impacts to habitats, flora and fauna from soils & land interactions are not predicted to be significant.
Hydrology	Interactions between hydrology and biodiversity including habitats, flora and fauna can occur through impacts to water quality either arising from an accidental pollution event or increased sedimentation during the construction stage or an accidental pollution event during the operational stage. This interaction has the potential to result in significant impacts on hydrologically connected habitats and sensitive fauna that rely on these habitats. However, for reasons outlined in the relevant sections above (i.e. 5.5.1.1 and 5.5.2.1) impacts to downstream sensitive habitats and fauna are not predicted to be significant.
Air Quality and Climate	Interactions between air quality and flora and fauna in adjacent habitats and designated sites can occur during the construction stage due to dust emissions arising from construction works. This interaction has the potential to result in significant impacts on biodiversity. However, once the dust minimisation measures outlined in the OCMP accompanying this report are implemented, impacts to flora and fauna are not predicted to be significant.

Noise and Vibration	Interactions between noise and sensitive fauna, namely birds, bats and badgers can occur and arise from increased noise levels during the construction stage. This interaction has the potential to result in significant impacts and has been assessed when considering disturbance impacts during construction. However, for reasons outlined in the relevant sections above (i.e. 5.5.1.6, 5.5.1.7 and 5.5.1.4) impacts to fauna from noise interactions are not predicted to be significant.
Conclusions	
A suite of mitigation measures have been outlined and provided all these mitigation measures are implemented in full, and remain effective throughout the lifetime of the Proposed Development, no significant negative impacts on the local ecology or on any designated conservation sites are expected from the Proposed Development.	

Table 14-4: Land and Soils

Land and Soil	
Summary	
Chapter 6 of this EIAR, *Land and Soil*, details the direct and indirect effects of the Proposed Development on the local land, soils, and geology; and sets out any required mitigation measures where appropriate.	
Interactions	
Population and Human Health	Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase of the Proposed Development that will be protective of site workers. Specific issues relating to Public Heath associated with the Proposed Development are set out in Chapter 4 of this EIAR.
Biodiversity	An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of conservation importance and proposes measures for the mitigation of these impacts.
Hydrology and Hydrogeology	An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. Procedures for the protection of receiving water environment are set out in Chapter 7 of this EIAR.
Air Quality and Climate	The excavation of soils across the Proposed Development Site and the temporary stockpiling of soils pending reuse or removal offsite has the potential to generate nuisance impacts (i.e., dust). An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR.
Landscape and Visual	During the construction phase the site landscape will undergo a change from playing fields and agricultural land to a mixed use residential and retail/commercial development. An assessment of

	the potential impact of the Proposed Development on the receiving landscape is included in Chapter 10 of this EIAR.
Material Assets: Waste, Utilities and Traffic	The Proposed Development will include the removal offsite of up to 40,850m^3 surplus soil and stone for reuse/recovery/disposal. An assessment of the potential impact of the Proposed Development on the material assets including built services, infrastructure and waste management is included in Chapter 12 of this EIAR.
Conclusions	
The mitigation measures outlined the CEMP and CDWMP and the respective Chapters outlined above, will ensure that there will be no significant adverse impacts on the receiving land, soil and geology associated with the Construction Phase and the Operational Phase of the Proposed Development.	

Table 14-5: Hydrology and Hydrogeology

Hydrology and Hydrogeology	
Summary	
Chapter 7 of this EIAR, *Hydrology and Hydrogeology*, provides an assessment of the potential impacts of the Proposed Development on hydrology, water and hydrogeology and sets out any required mitigation measures where appropriate.	
Interactions	
Population and Human Health	No public health issues associated with the water (hydrology and hydrogeology) conditions at the Proposed Development Site have been identified for the Construction Phase or Operational Phase of the Proposed Development. Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase that will be protective of site workers. It is noted that specific issues relating to Public Heath associated with the Proposed Development are set out in Chapter 4 of this EIAR.
Biodiversity	An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted a result of the Proposed Development are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.
Land, Soil, Geology and Hydrogeology	An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment during the Operational Phase of the Proposed Development is set out in Chapter 6 Land, Soil and Geology.
Material Assets	An assessment of the potential impact of the Proposed Development on the Material Assets including built services, infrastructure, traffic, and waste management has been set out in Chapter 12 of this EIAR. Any discharges to the public foul sewer and water supply to the Proposed Development will be under consent from Irish Water.

Conclusions
The mitigation measures outlined the CEMP and CDWMP and the respective Chapters outlined above, will ensure that there will be no significant adverse impacts on the receiving land, soil and geology associated with the Construction Phase and the Operational Phase of the Proposed Development. Overall, there will be no significant adverse impacts as a result of the Proposed Development on the receiving groundwater and surface water environment. The Proposed Development will have an overall 'imperceptible' impact on the receiving hydrological and hydrogeological environment.

Table 14-6: Air Quality and Climate

Air Quality and Climate	
Summary	
Chapter 8 of this EIAR, *Air Quality and Climate*, provides an assessment of the potential impacts of the Proposed Development on ambient air quality and climate, and sets out appropriate mitigation measures where necessary. The main air quality impacts that may arise during construction activities are: • Dust deposition; • Elevated particulate matter concentrations (PM_{10} and $PM_{2.5}$) as a result of dust generating activities on site; and • An increase in concentrations of airborne particles, volatile organic compounds, nitrogen oxides, and sulphur oxides due to exhaust emissions from diesel powered vehicles and equipment on site (non-road mobile machinery) and vehicles accessing the site. The greatest potential effect on air quality during the Operational Phase of the Proposed Development is from traffic-related air emissions.	
Interactions	
Population and Human Health	Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as negligible, therefore air quality impacts from the Proposed Development are not expected to have a significant impact on population and human health.
Biodiversity	Interactions between Air Quality and Biodiversity have been considered as the Construction Phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the construction works. However, the mitigation measures employed at the Proposed Development will ensure that the impacts to flora and fauna are not significant.

Land and Soil	The excavation of soils across the Proposed Development site and the temporary stockpiling of soils has the potential to generate nuisance impacts (i.e., dust). However, the mitigation measures employed at the Proposed Development will ensure that the impacts are not significant.
Material Assets: Traffic	There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate is insignificant.

Conclusions

Appropriate mitigation measures have been recommended and will be implemented at the Site to minimise the risk of dust emissions arising during the Construction Phase. These mitigation measures have been outlined in the Construction Environmental Management Plan (CEMP) for the Site, and provided such measures are adhered to, it is not considered that significant air quality impacts will occur.

Operational traffic will use regional and local roads to access the facility with potential increases of traffic flow on some roads and subsequent associated emissions of VOCs, nitrogen oxides, sulphur dioxides and increased particulate matter concentrations. As per the Traffic and Transport Assessment (Section 12.1), an Air Quality Assessment is not required, and it is therefore considered unlikely for significant air quality impacts to occur as a result of increased traffic flow.

Table 14-7: Noise and Vibration

Noise and Vibration	
Summary	
Chapter 9 of this EIAR, *Noise and Vibration*, provides a description and assessment of the likely impact of the proposed activities from noise, and sets out appropriate mitigation measures where necessary. The noise-generating activities associated with the Site are as follows: • Demolition and Extraction works, including site clearing and earthworks required to prepare the site for building foundations and installing utility services; • Development construction works; • Trucks entering and exiting the facility.	
Interactions	
Population and Human Health	The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and will not create any major negative impacts beyond the Site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development. It is noted that specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.
Biodiversity	It is not considered that the Noise and Vibration effects of the Proposed Development will have an adverse impact on biodiversity in the local area. While the proposed Construction Phase will result in a temporary increase in noise and vibration, it is considered that this will not cause a significant disturbance to the local fauna including birds due to the existing established urban environment.
Material Assets: Traffic	The Proposed Development will have no significant impact on overall traffic volumes and therefore traffic will not result in any significant increases of noise at sensitive receptors.
Conclusions	

The Construction Phase has the greatest potential for noise and vibration impacts on the surrounding environment; however this phase will be of short-term impact. A detailed construction programme has been developed and the Proposed Development is anticipated to run for 5 no. years in the following phases; Phase 1, 2, 2A, 3, 4 and 5.

During the Operational Phase of the development, no significant sources of noise or vibration are expected. No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase and therefore no detailed assessment is required as per the DMRB Guidelines. Refer to Chapter 12 of the EIAR for a detailed traffic assessment report. The impact of noise from operational traffic will be unnoticeable and will not have a negative impact.

Table 14-8: Landscape and Visual

Landscape and Visual	
Summary	
Chapter 10 of the EIAR, *Landscape and Visual Assessment*, provides a description and assessment of the likely impact of the Proposed Development on the landscape and visual amenities of the area.	
Interactions	
Population and Human Health	It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the rural and residential nature of the surrounding landscape, will cause any issues for the residential local population.
Biodiversity	The proposed landscaping of the Site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the Site. The landscaping proposals will entail losses and contributions in terms of vegetation at the Site, which in turn will affect the ecology of the Site. The Site in its current condition is not of high ecological value, and the proposed landscaping will not result in significant adverse effects in this regard. It is noted that the Proposed Development further negates any habitat loss through the provision of a number of planted garden areas and green roofing included in the project design. As such, no significant cumulative habitat loss will occur involving the Proposed Development.
Archaeology and Cultural Heritage	As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.
Conclusions	
Subject to implementation of all mitigation measures detailed in Chapter 10, there will be no negative residual impacts upon the landscape and visual resources.	

Table 14-9: Archaeology and Cultural Heritage

Archaeology and Cultural Heritage	
Summary	
Chapter 11 of the EIAR, *Archaeology and Cultural Heritage,* provides information on the known architectural, archaeological, and cultural heritage sites in the study area. This chapter assess the potential for the Proposed Development to impact any protected structures, archaeological sites, objects and monuments in the vicinity of the site.	
Interactions	
Landscape and Visual	It is not predicted that any changes in landscape or visual amenities will have a significant impact on the archaeology and cultural heritage of the area. Preserved / Protected Views, Protected Areas and Protected Structures have been assessed in full in Chapter 10 of this EIAR, Landscape and Visual.
Conclusions	
Subject to implementation of all mitigation measures detailed in Chapter 11, there will be no negative impacts upon the archaeological or cultural heritage resources surrounding the Proposed Development.	

Table 14-10: Material Assets - Traffic, Waste and Utilities

Material Assets - Traffic, Waste and Utilities	
Summary	
Chapter 12 of the EIAR, *Material Assets*, provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure.	
Interactions: Utilities and Waste	
Population and Human Health	The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Potential impacts on population and human health are addressed in Chapter 4.
Biodiversity	The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5 (Biodiversity).
Land and Soil	Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the site. Potential impacts on land and soils are addressed in Chapter 6.
Hydrology	Any connections to the public water network (water supply or foul sewer) during the Construction and Operational Phases will be under consent from Irish Water. Potential impacts on water are addressed in Chapter 7.
Traffic	Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the Kilternan area. Potential impacts on traffic are addressed in Chapter 12.1.
Interactions: Traffic	
Population and Human Health	Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of

	vehicles. There is potential for impacts on population and human health in relation to the capacity and operation of the surrounding road network. However according to Chapter 12.1 Traffic, the impact of development traffic is of the order of low in the case of the without GDRS to negligible when the GDRS is available.
Air Quality and Climate	There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate and traffic is insignificant.
Noise and Vibrations	Traffic has the potential to increase noise impacts on nearby sensitive receptors. The Proposed Development will have no significant impact on overall traffic volumes and therefore traffic will not result in any significant increases of noise at sensitive receptors.
Conclusions	
Subject to implementation of all mitigation measures, there will be no negative residual impacts upon the Material Assets, Traffic, Waste and Utilities.	

14.4 References

EIAR Chapters 4 to 12 inclusive.

15 MITIGATION AND MONITORING

15.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each Chapter exploring specific environmental aspects.

This Chapter of the EIAR collates and summarises the mitigation commitments made in Chapter 4 to Chapter 13.

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction Chapters, Population and Human Health Chapters and Archaeology and Cultural Heritage Chapters of EIARs.

15.2 Summary of Mitigation Measures

15.2.1 Population and Human Health

15.2.1.1 Construction Phase

15.2.1.1.1 Mitigation

During the Construction Phase of this Proposed Development HSE guidelines will be adhered to in relation to social distancing, cough and sneeze etiquette, face masks and hand washing. Appropriate welfare facilities will be provided at the facility. No specific mitigation measures are required during the Construction Phase of the Proposed Development in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air emissions (dust), noise, traffic, waste etc. are identified in their respective Chapters in this EIA Report.

15.2.1.1.2 Monitoring

No specific monitoring measures are proposed or required in relation to Population and Human Health for the Construction Phase of the Proposed Development.

Monitoring activities will be implemented for the Construction Phase in accordance with the CEMP submitted as part of this planning application. The monitoring of construction dust during the Construction Phase of the Proposed Development is recommended to ensure that impacts on air quality are not experienced beyond the Site boundary and human health is not affected.

15.2.1.2 Operational Phase

15.2.1.2.1 Mitigation

All workers employed during the Operational Phase of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that will be in place at that point in time in relation to Covid-19.

No other specific mitigation measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air emissions, noise, traffic etc. are identified in their respective Chapters in this EIAR.

15.2.1.2.2 Monitoring

No specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, monitoring in relation to air emissions, water, noise and traffic are identified in their respective Chapters in this EIAR.

15.2.2 Biodiversity

Mitigation measures are discussed only for KERs where a potential significant effect has been identified.

All measures described below will be implemented in full and included in the CEMP to accompany the planning submission. The CEMP is alive document that will be updated by the appointed contractor and will be included in it.

15.2.2.1 Construction Phase

15.2.2.1.1 Mitigation

15.2.2.1.1.1 Designated sites

As set out in sections 5.5.1.1.1 and section 5.5.1.1.2 (as well as within the separate Appropriate Assessment Screening Report accompanying this application with regard European sites (Scott Cawley Ltd 2022)), in concluding that the Proposed Development is not likely to have a significant effect on any European or Nationally designated sites, mitigation measures intended to avoid or reduce any harmful effects of the Proposed Development on designated sites did not form part of the assessment and were not taken into account.

15.2.2.1.1.2 Habitats

Any vegetation (including trees or hedgerows adjacent to, or within, the Proposed Development boundary) which is to be retained will be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b), as follows:

- All trees along the Proposed Development boundary that are to be retained, both within and adjacent to the Proposed Development boundary (where the root protection area of the tree extends into the Proposed Development boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees as per the requirements of the British Standard Institution (BSI) British Standard (BS) 5837:2012 Trees in relation to in relation to design, demolition and construction – Recommendation . Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist;
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it.
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines.
- A qualified arborist will assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the Proposed Development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist.

- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged.

15.2.2.1.1.3 Badger

As the usage of the Proposed Development site by badgers can change over time, a confirmatory pre-construction check of the Proposed Development site for new burrow entrances will be carried out immediately prior to construction works commencing to confirm their usage by badger.

Any new badger setts present will be afforded protection in line with the requirements set out in the NRA (2005) guidance document as follows:

- Badger setts where encountered will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage
- In the season June to November, no heavy machinery will be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances
- During the breeding season (December to June inclusive), none of the above works will be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of an ecologist with experience of badger mitigation.

15.2.2.1.1.4 Breeding Birds

Vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st of March and the 31st of August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within three days of the nest survey. Where the vegetation is not cleared within three days of checks, a repeat check will be required. Should nesting birds be encountered during surveys, the removal of vegetation will be required to be delayed until after the nesting has finished.

15.2.2.1.1.5 Bats

Although no evidence of bats was recorded in the buildings or PRF trees located within the Proposed Development site, precautionary mitigation has been proposed in the event that any bats are found to be roosting within the aforementioned structures, during demolition or clearance works, as the usage of the Proposed Development site by bats can change over time. A suitably qualified bat ecologist, licenced as necessary, will undertake a confirmatory preconstruction survey to assess for any changes since the planning surveys. Thereafter they will be on site during the demolition works of the building, and that if bats are encountered during any works at the site the relevant activity will be suspended until appropriate measures are enacted. A derogation licence may need to be sought from NPWS in order to permit removal of bats and mitigate for the loss of any roosts on the site. This may include measures as outlined in NRA guidance 2006c.

Lighting proposals for the construction phase will adhere to the advice provided in Bats and Lighting – Guidance for Planners, Engineers, Architects and Developers (Bat Conservation Ireland 2010), Bats and artificial lighting in the UK Bats and the Built Environment series Guidance Note 08/18 (Institution of Lighting Professionals & Bat Conservation Trust, 2018) and Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2011). Construction stage lighting details will be reviewed by a qualified bat ecologist. If necessary, the bat ecologist will recommend adjustments to directional lighting (e.g. through cowls, shields or louvres) to restrict light spill in sensitive areas.

15.2.2.1.2 Monitoring

A suitably experienced and qualified ecologist will be retained by the appointed contractor. The ecologist will advise the appointed contractor on ecological matters during construction, undertake preconstruction surveys as necessary, communicate all findings in a timely manner to the appointed contractor and statutory authorities, acquire any licenses / consents required to conduct the work, and supervise and direct the ecological measures associated with the Proposed Scheme.

Pre-construction surveys for PRFs (Section 5.6.1.5), breeding birds (Section 5.6.1.4) and badger (Section 5.6.1.3) will be carried out as described in the respective sections of Chapter 5 of this EIAR.

15.2.2.2 Operational Phase

15.2.2.2.1 Mitigation

15.2.2.2.1.1 Designated sites

As set out in sections 5.5.2.1.1 and section 5.5.2.1.2 above (as well as within the separate Appropriate Assessment Screening Report accompanying this application with regard European sites (Scott Cawley Ltd. 2022)), in concluding that the Proposed Development is not likely to have a significant effect on any European or Nationally designated sites, mitigation measures intended to avoid or reduce any harmful effects of the Proposed Development on designated sites were not required or taken into account.

15.2.2.2.1.2 Habitats

Mitigation measures are not required as no operational phase impacts are predicted on habitats as a result of the Proposed Development.

15.2.2.2.1.3 Badger

Mitigation measures are not required as no operational phase impacts are predicted on badgers as a result of the Proposed Development.

15.2.2.2.1.4 Breeding Birds

As an enhancement measure for the loss of nesting habitat and in order to provide additional nesting opportunities for breeding birds, 6 no. 1B Schwegler nest boxes[24] or similar will be installed within the Proposed Development site. The nest boxes will be installed at a minimum of 3m above ground level to ensure against disturbance from humans and domestic animals

[24] Bird and bat boxes are available to purchase online from NHBS www.nhbs.com and similar websites

such as cats. The boxes will be deployed across the site in appropriate locations, as advised by a suitably qualified ecologist.

15.2.2.2.1.5 Bats

Although no bat roosts were confirmed during the surveys, additional roosting opportunities for bats are being proposed to include 6 no. Schwegler 2F bat boxes[12] to be erected on suitable retained trees in suitable locations across the site, the location of which to be decided by a suitably qualified and experienced bat ecologist. This has been recommended as an enhancement measure for the site rather than a mitigation measure as no confirmed roosting site have been identified. This is separate to any additional bat boxes that might be conditioned by NPWS where a roost that will be lost is confirmed during pre-construction surveys.

15.2.2.2.2 Monitoring

It is recommended that post installation monitoring of the bird and bat boxes (outlined in Sections 5.6.2.4 and 5.6.2.5 respectively) is carried out to determine the efficacy of this measure.

These checks will be undertaken in years 1, 3 and 5 post construction with a memo provided to the client following each check.

15.2.3 Land and Soils

15.2.3.1 Construction Phase

15.2.3.1.1 Mitigation

An Outline Construction Management Plan (CMP) (Atkins Ireland, 2022), Outline Construction and Environmental Management Plan (CEMP) (Enviroguide Consulting, 2022b) and CDWMP (Enviroguide Consulting, 2022a) have been prepared as part of the planning application. The appointed Contractor will further develop the CMP, CEMP and CDWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground having the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA - C532', CIRIA, 2001).

The CMP, CEMP and CDWMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development.

15.2.3.1.1.1 Exportation of Soil and Bedrock

Prior to excavation, a detailed review of the final cut and fill model will be carried out to confirm cut and fill volumes. Detailed quantities of material to be excavated will be verified through accurate survey techniques and detailed in the CDWMP (Enviroguide Consulting, 2022a) which will be further developed by the appointed Contractor in advance of works commencing.

All surplus materials and any waste will be removed off-site in accordance with the requirements outlined in the CDWMP (Enviroguide Consulting, 2022a) and will be managed in accordance with all legal obligations.

The re-use of soil offsite will be undertaken in accordance with all statutory requirements and obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended.

Any surplus soil not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures

It will be the Contractor's responsibility to either; possess a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorisations, for the collection and movement of waste off-site. Material will be brought to an authorised facility that has been adequate assessed and any potential impacts mitigated as part of statutory consent procedures. Accordingly, there will be no impact on any off-site destination site associated with the Construction Phase of the Proposed Development.

Materials and waste will be documented prior to leaving the Proposed Development site. All information will be entered into a waste management register kept on the Proposed Development site.

Vehicles transporting material with potential for dust emissions to an off-site location will be enclosed or covered with a tarpaulin at all times to restrict the escape of dust.

Public roads outside the site will be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary. The wheels of all Lorries will be cleaned prior to leaving the site so that traffic leaving the site compound will not generate dust or cause the build-up of aggregates and fine material in the public domain. A wheel-wash or similar approved will be installed at the egress point and road sweeper will be deployed where necessary to ensure that public roads are kept free of debris.

15.2.3.1.1.2 Reuse of Soil and Stone

The reuse of excavated soil and stone for the Proposed Development (i.e., for structural fill, non-structural fill and landscaping) will be subject to testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development.

15.2.3.1.1.3 Management and Control of Soils and Stockpiles

The extent of the required work area and batter for bulk excavation at the site will be minimised where appropriate to prevent unnecessary excavation of soil and tracking over soil and subsoil outside of the excavation work areas as a result of compaction and rutting from construction traffic.

Dedicated internal haul routes will established and maintained by the contractor to prevent tracking over unprotected soils.

Exclusion zones will be established where soft landscaping is proposed in particular along site boundaries which are outside of the areas where excavation to ensure soil structure is maintained.

Segregation and storage of soils for re-use onsite or removal offsite and waste for disposal off site will be segregated and temporarily stored on-site pending removal or for reuse onsite in accordance with the CMP, CEMP and the CDWMP.

For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination reuse site or waste facility is pending, excavated soil for recovery/disposal will be stockpiled as follows:

- A suitable temporary storage area will be identified and designated;
- All stockpiles will be assigned a stockpile number;
- Soil waste categories will be individually segregated; and all segregation, storage and stockpiling locations will be clearly delineated on the site drawings;
- Erroneous pieces of concrete will be screened from the stockpiled soils and segregated separately;
- Soil stockpiles will be sealed to prevent run-off from the stockpiled material generation and/or the generation of dust; and
- Any waste that will be temporarily stored / stockpiled only impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross contamination with soil.

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust; and
- Stockpiles will not be located near Proposed Development site boundaries or sensitive receptors and a set-back of 100m will be maintained from any boundary with offsite receptors.

When a stockpile has been sampled for classification purposes, it will be considered to be complete and no more soil will be added to that stockpile prior to disposal. An excavation/stockpile register will be maintained on-site.

Waste will be stored on-site, including concrete, asphalt and soil stockpiles, in such a manner as to:

- Prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required);
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and
- Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust

15.2.3.1.1.4 Degradation of Soils

The segregation and stockpiling of soil and stone at the Proposed Development site pending reuse or removal offsite will be carefully managed and maintained in order to minimise potential impact on soil quality. Handling of the stockpiled soil and stone will be minimised and will not be disturbed once formed. Stockpiles will be formed to minimise infiltration or accumulations of rainwater in the stockpiles.

15.2.3.1.1.5 Import of Fill Materials

Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations.

The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with an Article 27 By-Product Notification. Therefore, any unsuitable material will be identified and avoided prior to importation to the Proposed Development site.

15.2.3.1.1.6 Concrete Works

The cementitious grout and other concrete works during the Construction Phase, will avoid any contamination of ground through the use of appropriate design and methods implemented by the Contractor and in accordance with CMP, CEMP and relevant industry standards.

All ready-mixed concrete will be delivered to the site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

A suitable risk assessment for wet concreting will be completed prior to works being carried out.

15.2.3.1.1.7 Handling of Fuels and Hazardous Materials

Any diesel, fuel or hydraulic oils stored onsite will be stored in bunded storage tanks in a dedicated impermeable area a least 30m from watercourses. The bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005) and will be properly secured against unauthorised access or vandalism. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

Waste oils and hydraulic fluids will be collected in bunded containers and removed from the Proposed Development for disposal or re-cycling.

A procedure will be drawn up which will be adhered to during refuelling of onsite vehicles. This will include the following:

- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area;
- Fuel will be delivered to plant on-site by dedicated tanker or in a delivery bowser dedicated to that purpose;
- All deliveries to on-site oil storage tanks will be supervised and records will be kept of delivery dates and volumes;
- In the case of a bowser, the driver or supervising foreman will check the delivery bowser daily for leakage;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur; and
- Where the nozzle of a fuel pump cannot be placed into the tank oil storage tank then a funnel will be used.

The appointed Contractor for the Construction Phase of the Proposed Development will ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site. Only emergency breakdown maintenance will be carried out on-site. Drip trays and spill kits will be available on-site to ensure that any spills from vehicles are contained and removed off-site.

There may also be the requirement for use of portable generators or similar fuel containing equipment during the Construction Phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times.

15.2.3.1.1.8 Emergency Procedures

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the Proposed Development site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards;
- All construction works staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and
- All construction works staff on-site will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving hydrological and hydrogeological environment associated with the Construction Phase of the Proposed Development. These measures will also ensure that there is minimal risk to soils and geology associated with the Construction Phase of the Proposed Development.

15.2.3.1.1.9 Welfare Facilities

Foul water discharge from the temporary welfare units at the site during the Construction Phase will be either tankered offsite in accordance with waste management legislation or discharged under temporary consent to the IW mains foul network for treatment at Shanganagh WWTP subject to agreement with Irish Water.

15.2.3.1.2 Monitoring

During construction phase the following monitoring measures will be considered:

- Inspections and monitoring will be undertaken during excavations and other groundworks to ensure that any geotechnical design measures are implemented and effective to prevent instability of soils during groundworks;
- Routine monitoring and inspections during refuelling and concrete works will be undertaken to ensure that there are no impacts and to ensure compliance with ameliorative, remedial and reductive measures.
- Monitoring and site audits will be undertaken daily by the appointed Contractor to check for any detectable nuisances such as, noise, dust, surface water runoff or other such issues associated with excavation, stockpiling and offsite removal of soil.
- Materials management and waste audits will be carried out at regular intervals to monitor the following:
    - Management of soils on-site and for removal off-site;
    - Record keeping;
    - Traceability of all materials, surplus soil and other waste removed from the Proposed Development site; and
    - Ensure records are maintained of material acceptance at the end destination.

15.2.3.2 Operational Phase

15.2.3.2.1 Mitigation

There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the Proposed Development.

15.2.3.2.2 Monitoring

There are no monitoring requirements specifically in relation to land, soil and geology during the Operational Phase of the Proposed Development.

15.2.4 Hydrology

15.2.4.1 Construction Phase

15.2.4.1.1 Mitigation

The construction works will be managed with consideration of applicable regulations and standard best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction sites, Guidance for Consultants and Contractors;
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on site (C650), 2005;
- BPGCS005, Oil Storage Guidelines;
- EPA (2004) IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities;
- CIRIA 697, The SUDS Manual, 2007;
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004;
- Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006);
- CIRIA C648: Control of water pollution from linear construction projects: site guide (Murnane et al. 2006); and
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters

The CMP, CEMP and CDWMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development.

Mitigation measures will be adopted as part of the construction works on the Proposed Development site. The measures will address the main activities of potential impact which include:

- Control and Management of Water and Surface Runoff;
- Management and control of imported soil and aggregates from off-site sources;
- Fuel and Chemical handling, transport, and storage; and
- Accidental release of contaminants – notify relevant statutory authorities.

As part of the overall construction methodology, sediment and water pollution control risks arising from construction-related surface water discharges will be considered. All works carried out as part of these infrastructure works will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environment Section of Dun Laoghaire Rathdown County Council this regard.

15.2.4.1.1.1 Control and Management of Water and Surface Runoff

There will be no discharges to groundwater or surface water during the Construction Phase.

Where necessary surface water at the Proposed Development site will be managed through robust water treatment methodologies in accordance with the CMP, CEMP, CDWMP and regulatory consents. Any surface water removed will be discharged into the public sewer in

accordance with the necessary consent/licence issued under Section 16 of the Local Government (Water Pollution) Acts and Regulations which will be obtained from Irish Water (IW) / DLRCC.

There will be no unauthorised discharge of water (groundwater or surface water runoff) to ground, drains or water courses during the Construction Phase of the Proposed Development

There may be a temporary increase in the exposure of the underlying groundwater during earthworks due to the temporary removal of hardstanding areas. Surface water runoff will be prevented from entering open excavations with sandbags or other approved methods proposed by the Contractor.

A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.

15.2.4.1.1.2 Control and Management of Soil and Stockpiles

Where possible, stockpiling of soil and stone on-site will be avoided. However, in the event that stockpiling is required, stockpiled materials pending removal off-site or reuse on-site will be located in in designated areas only and there will be no storage of materials within 10m of any open ditches / watercourses at the Proposed Development site. Where required during periods of wet weather appropriate containment measures will be implemented to prevent excessive runoff and entrainment of sediment. These will include battering of stockpiles, covering of stockpiles with tarpaulins and use of sandbags to contain any runoff from the stockpiles.

15.2.4.1.1.3 Importation of Materials

Contract and procurement procedures will ensure that all imported aggregates, soil and other construction materials required for the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations. The importation of aggregates will be subject to management and control procedures to ensure the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Therefore, any unsuitable material will be identified prior to unloading / placement on-site.

15.2.4.1.1.4 Concrete Works

Pre-cast concrete will be used where technically feasible to meet the design requirements for the Proposed Development. Where cast-in-place concrete is required, all work will be carried out to avoid any contamination of the receiving geological environment through the use of appropriate design and methods implemented by the appointed Contractor and in accordance with the CMP, CEMP and relevant industry standards.

All ready-mixed concrete will be delivered to the Proposed Development site by truck. The following measures will be implemented where poured concrete is being used on site:

- The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on site;

- Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
- Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
- Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite; and
- Surplus concrete will be returned to batch plant after completion of a pour.

15.2.4.1.1.5 Handling of Fuels and Hazardous Materials

Oils and chemicals used and stored on-site will be sealed, secured and stored in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas to prevent any seepage to ground. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

- Bunds will have regard to Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
    - 110% of the capacity of the largest tank or drum within the bunded area; or
    - 25% of the total volume of substance that could be stored within the bunded area.
- Vehicle or equipment maintenance work will take place in a designated impermeable area within the site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines;
- Site staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and
- All staff on-site will be fully trained on the use of equipment to be used on-site.
- Portable generators or similar fuel containing equipment will also be placed on suitable drip trays or bunds.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations on-site and will be from a road tanker brought to site as required. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the Contractor before the commencement of works on-site.

A procedure will be drawn up by the contractor which will be adhered to during refuelling of on-site vehicles. This will include the following:

- Fuel will be delivered to plant on-site by dedicated tanker;
- All deliveries to on-site vehicles will be supervised and records will be kept of delivery dates and volumes;
- The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and
- All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area.

15.2.4.1.1.6 Emergency Procedures

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the Proposed Development site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards;
- All construction works staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and
- All construction works staff on-site will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving hydrological and hydrogeological environment associated with the Construction Phase of the Proposed Development.

15.2.4.1.1.7 Welfare Facilities

Foul water discharge from the temporary welfare units at the site during the Construction Phase will be either tankered off-site in accordance with waste management legislation or discharged under temporary consent to the IW mains foul network for treatment at Shanganagh WWTP subject to agreement with Irish Water.

15.2.4.1.2 Monitoring

There are no monitoring requirements specifically in relation to hydrology and hydrogeology during the Construction Phase of the Proposed Development.

15.2.4.2 Operational Phase

15.2.4.2.1 Mitigation

Ongoing regular maintenance of the proposed drainage including the the SuDS measures in accordance with CIRIA SuDS Manual C753 will be incorporated into the overall management strategy for the Proposed Development.

There is no other requirement for mitigation measures for the Operational Phase of the Proposed Development.

15.2.4.2.2 Monitoring

There are no monitoring requirements specifically in relation to hydrology and hydrogeology during the Operational Phase of the Proposed Development.

15.2.5 Air Quality and Climate

15.2.5.1 Construction Phase

15.2.5.1.1 Mitigation Air Quality

It is not expected that adverse air quality impacts are likely to occur at sensitive receptors as a result of the Proposed Development. However, appropriate mitigation measures, as outlined within the Construction and Environmental Management Plan (CEMP), which has been prepared by Enviroguide Consulting, will be employed as necessary to further prevent such impacts occurring:

- Vehicle and wheel washing facilities will be provided at site exit where practicable. If necessary, vehicles are to be washed down before exiting the site.
- Netting is to be provided to enclose scaffolding to mitigate escape of air borne dust from the existing buildings.
- Shroud piling machinery as shown below when operating near to boundaries.
- Engines and exhaust systems should be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
- Dust emission over the site boundary should be minimised using static sprinklers or other watering methods as necessary.
- No burning of materials to be permitted on site.
- Water sprays for dust suppression should be affixed to mechanical excavators/munchers involved in demolition works.
- Demolition waste should be removed from site as quickly as possible to minimise risk of dust generation and any fine material should be covered with a tarpaulin or similar material and tied down.
- Water sprays and cannons should be used where possible during cutting, with protective measures applied to retained finishes local to the cutting.
- Prior to commencement, the Main Contractor should identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions.
- In areas of poor natural ventilation, dust capture/extraction methods should be employed by the Main Contractor.
- The Main Contractor should allocate suitably qualified and experienced personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
- The Main Contractor will be required to appoint a senior member of its site management team to act as the liaison with third parties in respect of complaints regarding dust and or site activities.
- Monitoring of dust deposition should be undertaken at nominated boundary locations to ensure that dust levels comply with the TA Lift limit value of 350mg/(m²/day) based on a 30-day average using Bergerhoff gauges (Limits to be agreed with local authority).

15.2.5.1.2 Mitigation Climate

As negative climatic impacts associated with the Construction and Operational Phases of the Proposed Development are negligible, no mitigation measures are proposed. Best practice

measures will be implemented to minimise exhaust emissions from construction and operational vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods. Furthermore, all proposals for development will seek to achieve the greatest standards of sustainable construction and design and will have regard to sustainable building design criteria.

15.2.5.1.3 Monitoring

The monitoring of construction dust during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at a strategic locations along the site boundaries for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of *VDI 2119* with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the Gauges should be removed from the site; the dust deposits in each Gauge will then be determined gravimetrically and expressed as a dust deposition rate in mg/m^2/day in accordance with the relevant standard.

15.2.5.2 Operational Phase

15.2.5.2.1 Mitigation

It has been determined that the Operational Phase air quality impact is negligible and therefore no site-specific mitigation measures are proposed.

15.2.5.2.2 Monitoring

Due to the negligible impact on air quality and climate from the Operational Phase of the Proposed Development, no specific monitoring is recommended.

15.2.6 Noise and Vibrations

15.2.6.1 Construction Phase

15.2.6.1.1 Mitigation

In order to control likely noise impacts caused by the Proposed Development, best available technology will be employed by the Main Contractor to minimise noise from the construction operations and will comply with the mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

The Main Contractor will monitor the likelihood of prolonged exposure to excessive noise and will commission a noise surveying/monitoring where necessary. The following control measures are to be implemented by the Main Contractor:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise;
- The Main Contractor will assess risk arising from noise prior to each activity taking place and determine appropriate action. The aim will be to minimise the exposure to excessive noise levels;
- If it is likely that the noise exposure exceeds Lower Action Value, then hearing protection must be made available;
- If it is likely that the noise exposure exceeds Upper Action Value, then hearing protection is mandatory to be used. The work supervisor will decide on the most suitable hearing protection to be used based on exposure and worker's personal preference (earmuffs or earplugs);
- The Main Contractor will ensure proposed measures are put in place and that their effectiveness and suitability is evaluated on regular bases;
- The Main Contractor will minimise noise at work by looking for alternative processes and/or working methods, which would make the work quieter and/or exposure times shorter;
- The Main Contractor will liaise with all sub-contractors to effectively control noise exposure;

- The number of people working near source of the noise will be minimised;
- Plant and machinery will be compliant with current legislation and fitted with silencers where possible;
- Employees must use hearing protection where its use is made compulsory;
- Hearing protection zones will be identified where necessary;
- Spot checks on appropriate use of hearing protection will be carried out;
- Operators of rock breaking machines and workers nearby must wear adequate ear protection;
- During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise;
- All plant to be serviced and maintained in good working order to ensure noise production is kept to a minimum;
- Idle plant to be switched off or throttled down to both save energy and reduce noise emissions;
- All plant operators to be qualified in their specific piece of plant;
- Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable;
- If the Contractor gets a complaint about noise from a neighbour, he will act immediately to remedy the situation.

15.2.6.1.2 Monitoring

The mitigation measures outlined in Section 15.2.6.1.1 and Section 9.6 of this EIAR are to be implemented and furthermore, the Main Contractor will monitor the likelihood of prolonged exposure to excessive noise and commission a noise surveying/monitoring programme where necessary.

15.2.6.2 Operational Phase

15.2.6.2.1 Mitigation

No monitoring is proposed during the Operation Phase of the Proposed Development.

15.2.6.2.2 Monitoring

The mitigation measures outlined in Section 15.2.6.1.1 and Section 9.6 of this EIAR are to be implemented and furthermore, the Main Contractor will monitor the likelihood of prolonged exposure to excessive noise and commission a noise surveying/monitoring programme where necessary.

15.2.7 Landscape and Visual

15.2.7.1 Construction Phase

15.2.7.1.1 Mitigation

The key landscape and visual mitigation measures used during the Construction Phase have been incorporated into the layout of the site and design of the proposed buildings. The buildings will be low height (2-5 storeys), clad in a similar neutral colored material and will have a similar horizontal emphasis.

The measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the Site is kept tidy, dust is kept to a minimum, and that any locations close to public areas are kept free from building material and site rubbish.

Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound(s) and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

For those trees proposed for retention, all necessary mitigation measures will be put in place in order to prevent or reduce impact to its very minimum. Mitigation measures used will need to include the erection of protective fencing at the very start of the works, ground protection installation within root zones where fencing cannot be erected to enclose the entire root zones, monitoring of the site works by the project Arboriculturist throughout the construction process and the use of tree friendly techniques and products for the construction process.

15.2.7.1.2 Monitoring

Landscape tender drawings and specifications have been produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect. The planting works will be undertaken in the planting season after completion of the main civil engineering and building work.

Any construction works within close proximity to retained trees are advised to be undertaken in accordance with approved method statements prepared by the construction contractor under the direct supervision of a qualified consultant Arboriculturist. Therefore, during the construction works, a professionally qualified Arboriculturist is recommended to be retained by the principal contractor or site manager to monitor and advice on any works within the RPA of retained trees to ensure successful tree retention and planning compliance. The Arboriculturist is to make regular site visits to ensure that the tree protection measures are in place and adhered to.

15.2.7.2 Operational Phase

15.2.7.2.1 Mitigation

No mitigation measures are proposed for the Operational Phase.

15.2.7.2.2 Monitoring

Monitoring of the mitigation measures will form part of the landscape management plan. Replacement trees, replacement planting and pruning measures will be captured in landscape maintenance plans, and are intrinsically linked to the proposed mitigation measures. All landscape works will be in an establishment phase for the initial three years from planting. A landscape maintenance plan accompanies the planning application. Prior to completion of the landscape works, a competent landscape contractor will be engaged and a detailed maintenance plan, scope of operation and methodology will be put in place.

15.2.8 Archaeology and Cultural Heritage

15.2.8.1 Construction Phase

15.2.8.1.1 Mitigation

It is possible that excavation works associated with the Proposed Development may have an adverse impact on small or isolated previously unrecorded archaeological features or deposits that have the potential to survive beneath the current ground level. If any archaeological remains are discovered during this project, all works will cease and an expert archaeologist will be brought to site and all future works will be carried out under the supervision of the archaeologist.

15.2.8.1.2 Monitoring

No specific monitoring measures are required in relation to archaeology and cultural heritage given the fact that it is not predicted that the Proposed Development will have any adverse impacts on any archaeological features or deposits.

15.2.8.2 Operational Phase

15.2.8.2.1 Mitigation

Since no known archaeological, architectural or cultural heritage remains were found during the desk top survey, it is likely that there are no further mitigation measures required for this development.

15.2.8.2.2 Monitoring

No specific monitoring measures are required in relation to archaeology and cultural heritage given the fact that it is not predicted that the Proposed Development will have any adverse impacts on any archaeological features or deposits.

15.2.9 Materials Assets – Waste and Utilities

15.2.9.1 Construction Phase

15.2.9.1.1 Mitigation

Specific avoidance, remedial and mitigation measures will be required for the Proposed Development. The measures that will be taken to ensure that there will be no significant impact on the surrounding Material Assets during the Construction Phase include:

Waste will be stored onsite in such a manner as to:

- Prevent environmental pollution.
- Minimise nuisance generation such as dust.
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling, and recovery.

In the event that hazardous soil, or historically deposited waste is encountered during the site bulk excavation phase, the contractor will notify DLRCC and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the proposed authorised waste collector(s). According to the CDWMP, it is anticipated that there will be no asbestos containing materials (ACMs) generated during the Construction Phase of the Proposed Development. If ACMs are identified on site at a later stage, a full asbestos report will be carried out. Removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACM's will only be removed from site by a suitably permitted/licenced waste contractor. in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.

Additionally, a Construction Environmental Management Plan will be in effect for the full duration of works. The Health and Safety Authority's "Code of Practice for Avoiding Danger From Underground Services" will be followed during construction and excavation activities and all underground and overhead utilities and public services will be identified and protected during the Construction Phase. All temporary suspensions to public services will be controlled by the relevant statutory undertaker, in accordance with standard protocols and all services will be reinstated as soon as possible post connection. Potable water networks and foul water sewers will be properly tested prior to connection.

15.2.9.1.2 Monitoring

The monitoring of C&D waste during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the site boundary. The Main Contractor will be responsible for monitoring and record keeping in respect of waste leaving the site and that these records will be maintained on site.

15.2.9.2 Operational Phase

15.2.9.2.1 Mitigation

No mitigation measures are proposed for the Operational Phase of the Proposed Development.

15.2.9.2.2 Monitoring

The building management company, residents, tenants, retail units and creche operators will be required to maintain the bins and storage areas in good condition as required by the DLRCC Waste Bye-Laws. The waste strategy presented in the OWMP will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy. The areas will be fitted with CCTV for monitoring.

15.2.10 Materials Assets - Traffic

15.2.10.1 Construction Phase

15.2.10.1.1 Mitigation

Based on the analysis undertaken in Section 12.1.5.1 the traffic impacts associated with construction of the Proposed Development are expected to be negligible. An outline Construction Management Plan provides details of measures proposed to further reduce the impact of construction activity. As the contractor to build the development has not been awarded and the construction programme and methodology may change a detailed construction management plan could be provide and agreed with the Planning Authority prior to work commencing on site.

15.2.10.1.2 Monitoring

Based on the result no monitoring is required.

15.2.10.2 Operational Phase

15.2.10.2.1 Mitigation

No mitigation measures are proposed for the Operational Phase of the Proposed Development.

15.2.10.2.2 Monitoring

Based on the result no monitoring is required.