PROPOSED RESIDENTIAL DEVELOPMENT AT CHURCH FIELDS EAST, MULHUDDART, DUBLIN 15

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) VOLUME 2: MAIN TEXT

BSM Est. 1968

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Built. Environment.

Environmental Assessment **Built Environment**

Client: Fingal County Council

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CONTENTS

1 Introduction

1.1 Overview

This Environmental Impact Assessment Report (EIAR) provides a statement of the effects that the proposed residential development at Church Fields East in Mulhuddart, Dublin 15 ('the proposed development'), if carried out, would have on the environment. It has been prepared in accordance with the provisions of the Planning and Development Act 2000 – 2023 ('PDA 2000'), the Planning and Development Regulations 2001 – 2023 ('PDR 2001') and the relevant guidance documents, as detailed herein.

1.2 The Applicant

The Applicant is Fingal County Council.

1.3 The Proposed Development

1.3.1 Site of the Proposed Development

The proposed development site is located in the peri-urban area of Dublin 15, c. 11.5km to the north-west of Dublin city centre and c. 1.5km north of Blanchardstown town centre. The site is situated in the administrative area of Fingal County Council, in the townland of Tyrrelstown, the local electoral area of 'Blanchardstown Mulhuddart' and the electoral division of 'Blanchardstown-Tyrrelstown'.

The development site is located between a stand of mature tree along Church Road to the east, the permitted Church Fields Housing and Eastern Linear Park Development (PARTXI/012/21) to the west (proposed commencement later in 2023), Damastown Avenue to the north, and a new linear park to the south. The site is located west of protected structure RPS No. 670 Mulhuddart Church (in ruins) and Graveyard, which is located east of Church Road. Further to the south-west of the proposed development site are the existing residential areas of Avondale and Wellview where recent housing extension works have been completed. The surrounding area is a relatively new suburban area comprising a mix of uses from residential to commercial. A 110KV overhead powerline runs across the north-eastern section of the site.

Further to the north of the Damastown Avenue the lands are in community use comprising of a church and educational facilities (Powerstown Educate Together National School Tyrrelstown and Gaelscoil an Chuilinn). Tyrrelstown local centre is c. 750m to the north-east of the proposed development. Lady's Well Park is c. 100m to the south-east of proposed development site. The TU Dublin Blanchardstown Campus is a further c. 720m to the south-east. Further to the north-east are the Amazon Data Centre Technology Park, Pharmaceutical facilities, Blanchardstown Corporate Park, Northwest Logistics and Business Park and, Ballycoolin Business Park, while to the south-west is the Damastown Industrial Park and Plato Business Park comprising light industrial and pharmaceutical activities. **Figure 1.1** and **Figure 1.2**, below, illustrate the location of the proposed development site.

1.3.2 Overview of the Proposed Development

The proposed development relates to a site of c.5.52 hectares at Church Fields East, Mulhuddart, Dublin 15. The development site is located south of Damastown Avenue; west of Church Road; east of previously permitted residential development at Church Fields (Planning Reg. Ref.: PARTXI/012/21); and

north of a permitted linear park (Eastern Linear Park Planning Reg. Ref.: PARTXI/012/21), in the townland of Tyrrelstown, Dublin 15. The proposed development seeks the construction of 217 no. residential units (ranging from 2 – 4 storeys in height) in a mixed tenure development, comprising of 121 no. houses and 96 no. apartments. The development will also include the provision of car parking, cycle parking, new pedestrian / cycle links, services, drainage and attenuation, and all associated site and infrastructural works.

Figure 1.1 Location of the proposed development

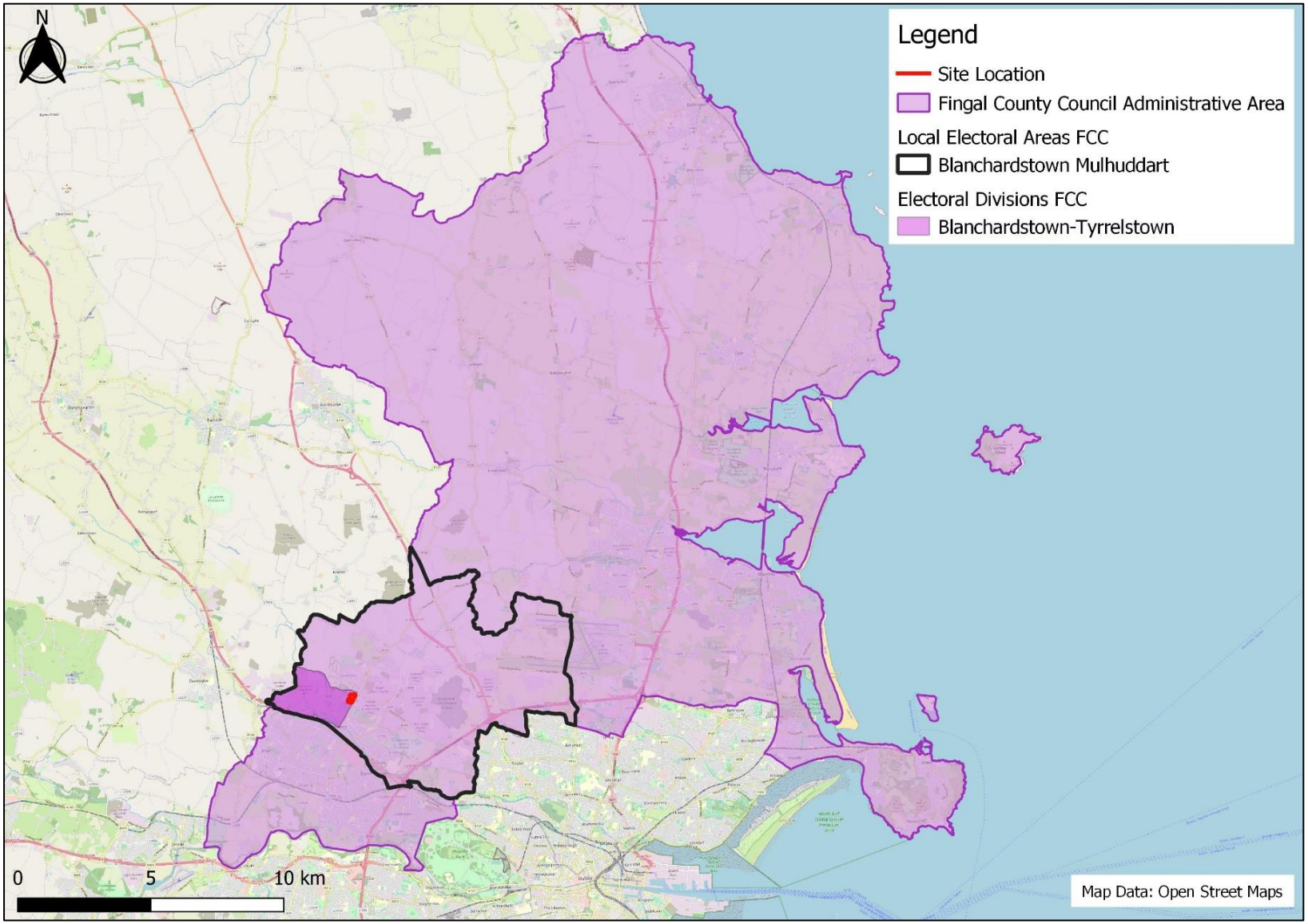


Figure 1.2 Site of the proposed development

1.4 Environmental Impact Assessment

Environmental Impact Assessment (EIA) is the *"process of examining the anticipated environmental effects of proposed project – from consideration of environmental aspects at design stage, through consultation and preparation of an Environmental Impact Assessment Report (EIAR), evaluation of the EIAR by a competent authority, the subsequent decision as to whether the project should be permitted to proceed, encompassing public response to that decision"*, as defined in the Environmental Protection Agency (EPA)'s 2022 *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (Appendices, p. 73) ('the EPA guidelines'). The EIAR provides a statement of the effects, if any, which a proposed development, if carried out, would have on the environment.

An overview of the EIA process and steps involved is provided in **Table 1.1**. A detailed discussion of the EIA process is provided in Chapter 2.

Table 1.1 Overview of the EIA process

Stage	Description	Status
Screening	*Is an EIA required?*	Completed: Yes
Scoping	The process of identifying the significant issues which should be addressed in the EIAR, as well as the methods of carrying out the assessment	Completed
EIAR	This stage includes: ▪ Collection of baseline information ▪ Analysis of the proposed development ▪ Assessment of impacts ▪ Identifying appropriate mitigation and monitoring measures	**Current stage**
Review & Decision	The EIAR accompanies the planning application to the planning authority (An Bord Pleanála) for determination of the application	Next stage
Monitoring	Implementation of the proposed mitigation and monitoring measures	Implemented in case of development consent

1.5 Format & Structure of the Environmental Impact Assessment Report

This EIAR has been completed in accordance with the requirements as set out in the EIA Directive, (2011/92/EU), as amended by Directive 2014/52/EU and relevant guidelines and documentation. The composition of this EIAR is in accordance with EPA Guidelines (2022) which requires that information contained within an EIAR should be in accordance with Article 3(1), Article 5(1) and any additional information specified under Annex IV under the Directive 2014/52/EU. Refer to **Table 1.2** below for the structure of the EIAR.

Table 1.2 Structure of the EIAR

Section	Description
Volume 1:	**Non-technical Summary (NTS)**
A summary of the EIAR in non-technical language	
Volume 2:	**Main Report**
Chapter 1	Introduction
Chapter 2	The EIA Process

Section	Description
Chapter 3	Planning & Development Context
Chapter 4	Consideration of Alternatives
Chapter 5	Description of the Proposed Development
Chapter 6	Consultation
Chapter 7	Population & Human Health
Chapter 8	Biodiversity
Chapter 9	Land, Soils, Geology & Hydrogeology
Chapter 10	Hydrology
Chapter 11	Air Quality
Chapter 12	Climate
Chapter 13	Noise & Vibration
Chapter 14	Landscape & Visual
Chapter 15	Cultural Heritage, Archaeology & Architectural Heritage
Chapter 16	Microclimate – Daylight & Sunlight
Chapter 17	Traffic & Transportation
Chapter 18	Material Assets – Waste
Chapter 19	Material Assets – Services
Chapter 20	Interactions
Chapter 21	Cumulative Impacts
Chapter 22	Mitigation Measures & Monitoring
Volume 3:	Appendices
Technical reference material supporting the EIAR chapters	

Article 5(1) and Annex IV of the EIA Directive provides detail on the information to be included in an EIAR. **Table 1.3** provides a checklist of the information referred to in Article 5(1) with a confirmation of where the relevant information is contained within the EIAR.

Table 1.3 Information required under EIA Directive Annex IV

Information Referred to in EIA Directive Article 5(1)	EIAR Section
1.Description of the project, including in particular:	
(a) a description of the location of the project;	Volume 2, Chapter 1
(b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;	Volume 2, Chapter 5
(c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;	Volume 2, Chapter 5
(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.	Volume 2, Chapter 5 Volume 2, Chapter 7 to 19
2. 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 project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	Volume 2, Chapter 4

Information Referred to in EIA Directive Article 5(1)	EIAR Section
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	Volume 2, Chapter 1, Chapter 4 and Chapter 7 to 19
4. A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	Volume 2, Chapter 7 to 22
5. A description of the likely significant effects of the project on the environment resulting from, inter alia:	
(a) the construction and existence of the project, including, where relevant, demolition works;	Volume 2, Chapter 7 to 22
(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;	Volume 2, Chapter 7 to 22
(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;	Volume 2, Chapter 7 to 22
(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)	Volume 2, Chapter 7, Chapter 12, Chapter 15, Chapter 2 (Section 2.5.1)
(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;	Volume 2, Chapter 21
(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;	Volume 2, Chapter 12
(g) the technologies and the substances used.	Volume 2, Chapter 5
The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project.	Volume 2, Chapter 7 to 22
6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	Volume 2, Chapter 7 to 22
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	Volume 2, Chapter 7 to 22
8. A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks	Volume 2, Chapter 2 (Section 2.5.1), Chapter 7 to 22

Information Referred to in EIA Directive Article 5(1)	EIAR Section
of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council (*) or Council Directive 2009/71/Euratom (**) or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	
9. A non-technical summary of the information provided under points 1 to 8.	Volume 1
10. A reference list detailing the sources used for the descriptions and assessments included in the report.	Volume 2, Chapter 7 to 22

1.5.1 EIAR Chapters Structure

Each of the topic chapters in Volume 2 of this EIAR, will be generally presented under the following headings:

1.5.1.1 Introduction

This section of each chapter provides an overview of aims and objectives of the chapter in assessing the proposed development and outlines the scope of the assessment.

1.5.1.2 Method

This section of each chapter provides detail on the guidelines and methodologies used to describe the baseline environmental conditions and to predict likely effects on the environment of the proposed development during both the construction and operational phase. The data and survey requirements along with the study area for each chapter vary depending on the environmental topic and have been chosen by each specialist based on relevant legislation, best practise guidance, policy requirements, and professional judgement.

1.5.1.3 Baseline Environment

Each chapter provides a description of the existing environmental conditions, focusing on aspects of the project relevant to the individual assessment. This section describes the findings of the desktop assessment, field surveys and information gained through any consultations carried out.

1.5.1.4 Predicted Impacts

The main purpose of the EIAR is to identify, describe and evaluate the likely significant impacts of the proposed development on the environment both during construction and operational phase. Each specialist reviewed the details of the proposed development and along with the baseline information collected, predicted the impacts of the proposed development on the environment.

The EPA Guidance (2022) provides guidance on impact assessment methodology and has been described further in Section 1.6.

1.5.1.5 Mitigation Measures

Each chapter provides a description of any specific mitigation measures envisaged to avoid, prevent, reduce or, if possible, offset any significant adverse effects on the environment identified under the assessment of potential impacts described above. Furthermore, Chapter 22 of the EIAR collates and summarises the mitigation measures that have been identified in the individual chapters.

1.5.1.6 Residual Impacts

The residual effects are the final predicted or intended effects which occur after the proposed mitigation measures have been implemented. Each chapter includes a section describing significant residual impacts that will continue to exist after mitigation has been implemented.

1.5.1.7 Monitoring

Each chapter includes a description (if any) of the proposed monitoring of effects on the environment which might be necessary, covering the monitoring methods and the agencies responsible for their implementation. Furthermore, Chapter 22 of the EIAR collates and summarises the monitoring measures that have been identified in the individual chapters.

1.5.1.8 Interactions

Each chapter of the EIAR provides a description of the key interactions and inter-relationships identified between the topics addressed within this EIAR. Chapter 20 of the EIAR provides an overview of the key interactions identified and addressed in the foregoing chapters of the EIAR.

1.5.1.9 Cumulative Impacts

Chapter 21 of the EIAR discusses the potential for cumulative impacts to arise as a result of the proposed development in combination with other projects. Each of the specialist contributors to this EIAR have considered the potential for cumulative impacts to arise, with particular reference to the projects listed in Chapter 21.

1.5.1.10 Difficulties Encountered

This section includes any limitations that may affect the reliability of baseline data and include the availability, completeness, accuracy, age and accessibility of data.

1.5.1.11 References

Each chapter provides a list of documents and information used to inform the assessment.

1.5.2 The Environmental Impact Assessment Team

The EIAR was coordinated by Brady Shipman Martin (BSM). Various environmental specialists were commissioned to complete the specialist chapters of the EIAR, as required by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment:

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

A description of experts who have contributed to this EIAR, their qualifications, experience and any other relevant credentials is provided in Table 1.4.

Table 1.4 EIAR contributors

Name	Company	Role / input	Qualifications
Pauline Byrne	BSM	Planner	**BSc Mgmt., Adv. Dip. Marketing, MA Regional & Urban Planning** ■ Head of Planning ■ Member of Royal Town Planning Institute (MRTPI) ■ Member of Irish Planning Institute (MIPI) ■ Over 20 years of experience
Thomas Burns	BSM	EIAR technical review; Landscape and Visual	**B.Agr.Sc. (Land.) Dip. EIA Mgmt., Adv. Dip. Plan. & Env. Law** ■ Environmental Planner and Landscape Architect ■ Member of Irish Landscape Institute & Irish Environmental Law Association ■ Over 30 years of experience in EIA and LVIA
Matthew Hague	BSM	EIAR technical review; Biodiversity	**BSc, MSc, Adv. Dip. Plan. & Env. Law** ■ Associate & Senior Ecologist ■ Chartered Environmentalist – CEnv ■ MCIEEM ■ Member of Irish Environmental Law Association ■ Over 20 years of experience
Namrata Kaile	BSM	EIAR Co-ordinator; Background chapters; Population & Human Health; Biodiversity	**BSc Life Sciences, MSc Env. Sciences** ■ Environmental Consultant & Ecologist ■ Qualifying Member CIEEM ■ Over 3 years of experience
Teri Hayes	AWN Consulting	Land, Soils, Geology & Hydrogeology; Hydrology	**BSc MSc Adv Dip Planning & Environmental Law** ■ Geologist & Hydrogeologist ■ PGeo and EurGeol ■ 30 years' experience

Name	Company	Role / input	Qualifications
Hana Blandford	AWN Consulting	Land, Soils, Geology and Hydrogeology	**BSc Agri-Environmental Science, M.Phil International Peace Studies** ■ Environmental Consultant
Luke Maguire	AWN Consulting	Hydrology	**BSc GeoScience** ■ Environmental Consultant ■ 2.5 years' experience
Avril Challoner	AWN Consulting	Air Quality; Climate	**BEng (Env), PhD, CSci, CEnv** ■ Air Quality and Climate Consultant ■ Member Institute of Environmental Management and Assessment, Member Institute of Air Quality Management ■ 10 Year of Experience in Consultancy
Dominic Wright	AWN Consulting	Noise & Vibration	**Extended Diploma in Music Technology, IOA Diploma in Acoustics and Noise Control** ■ Acoustic Consultant ■ Associate Member IOA (AMIOA) ■ Experience in compiling environmental noise assessments over a variety of sectors and developments
Clare Crowley	Courtney Deery Heritage Consultancy Ltd.	Cultural Heritage, Archaeology & Architectural Heritage	**PhD Archaeology, BA (Hons) Archaeology, Certificate in Condition Surveys of Historic Buildings, Certificate in Repair & Conservation of Historic Buildings** ■ Senior Archaeologist & Heritage Consultant ■ Over 20 years' experience
Andrew Cruise	Waterman Moylan	Microclimate – Daylight & Sunlight	**BTech Building Services Engineering, BScEng Energy Management** ■ Project Engineer ■ Over 6 years of experience

Name	Company	Role / input	Qualifications
Niall Coughlan	Waterman Moylan	Microclimate – Daylight & Sunlight	Director, Building Services ■ CEng, Engineers Ireland ■ BA, BAI ■ RConsEI ■ Over 22 years industry experience.
Ian Worrell	Waterman Moylan	Traffic & Transportation Material Assets – Services	BScEng, DipEng, CEng, MIEI, PEng, DipPhysPlg ■ Associate ■ Chartered Civil Engineer (CEng) ■ Professional Engineer (PEng) ■ Over 26 Years experience
Fernando Silva	Waterman Moylan	Traffic & Transportation	BEng Environmental Engineering ■ Senior Transportation Engineer ■ Associate Member CIHT (AMCIHT) ■ Over 6 years of experience
Noel Mahon	Waterman Moylan	Traffic & Transportation; Material Assets-Services	MEng Civil Engineering ■ Senior Civil Engineer ■ Member Engineers Ireland MIEI ■ Over 7 years of experience
Chonaill Bradley	AWN Consulting	Material Assets- Waste	BSc Environmental Science ■ Environmental Consultant ■ Associate Member CIWM ■ Over 8 years of experience

1.6 Impact Assessment Methodology

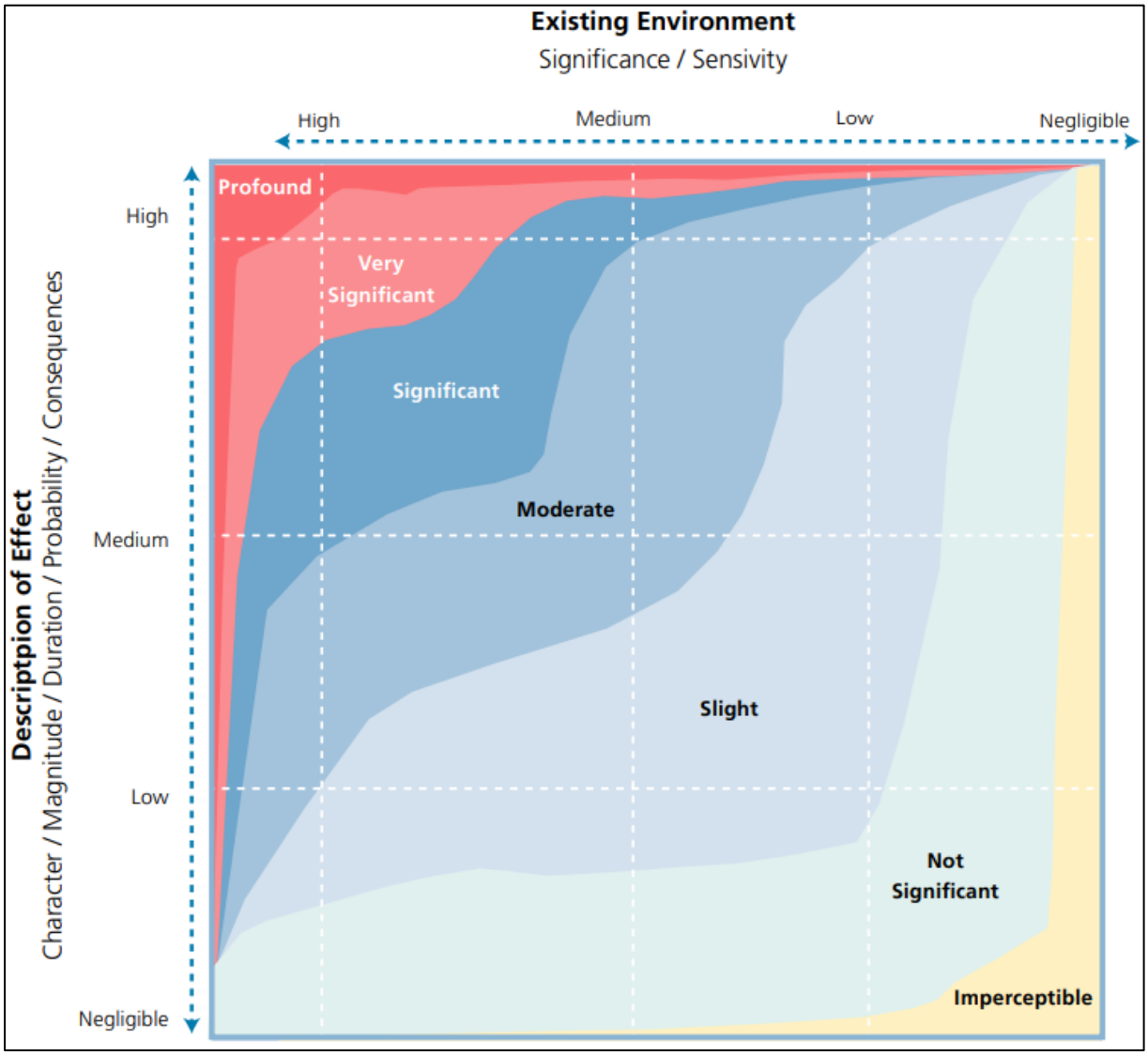
The impact assessment methodology is detailed in the respect of the various environmental topics in the respective chapters herein. The assessment of impacts is based on the source-pathway-receptor model, which dictates that, for an environmental impact to occur, there must be a source, a receptor which is sensitive to the effect in question, and a pathway by which the effect can reach the receptor. Unless otherwise stated, the criteria for effect / impact characterisation are as per the EPA guidelines (as set out in Table 1.5). The significance of an impact is determined through comparison of the character of the predicted effect to the sensitivity of the environment / receptor in question (Figure 1.3).

Table 1.5 Description of effects (adapted from EPA, 2022)

Criteria	Definition
Quality of Effects	
Positive	A change that improves the quality of the environment (for example, by increasing species diversity, improving reproductive capacity of an ecosystem, removing nuisances or improving amenities).
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative / adverse	A change that reduces the quality of the environment (for example, lessening species diversity, diminishing the reproductive capacity of an ecosystem, damaging health / property or causing nuisance).
Significance of Effects	
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect that causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect that 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 that, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very significant	An effect that, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect that obliterates sensitive characteristics.
Extent and Context of Effects	
Extent	The size of the area, number of sites, or proportion of a population affected by an effect.
Context	Describes whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (i.e. *is it the biggest, longest effect ever?*)
Probability of Effects	
Likely	The effects that can reasonably be expected to occur because of a proposed development if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of a proposed development if all mitigation measures are properly implemented.
Duration, Reversibility & Frequency	
Momentary	Effects lasting from seconds to minutes.
Brief	Effects lasting less than a day.
Temporary	Effects lasting less than a year.

Criteria	Definition
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects that can be undone (for example, through remediation or restoration).
Frequency	How often the effect will occur (e.g. once, rarely, occasionally, frequently, constantly, hourly, daily, weekly, monthly, annually, etc.).
Type of Effects	
Indirect / secondary	Impacts that are not a direct result of a proposed development, often produced away from the site or because of a complex pathway.
Cumulative	The addition of many minor or significant effects, including effects of other plans and / or projects, to create larger, more significant effects.
Do-nothing	The environment as it would be in the future should the proposed development not be carried out.
Worst-case	The effects arising from a proposed development in the case where mitigation measures substantially fail.
Indeterminable	When the full consequences of a change in the environment cannot be described.
Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual	The effect that will occur after the proposed mitigation measures have been implemented.
Synergistic	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO_x and NO_x to produce smog).

Figure 1.3 Determination of significance of effect (EPA, 2022)



2 The Environmental Impact Assessment (EIA) Process

2.1 Legislation

The EIA Directive is the cornerstone of EIA legislation. It aims to ensure a high level of protection for the environment and human health, and provides for public participation in relation to development consent and environmental matters. It requires that an assessment of the 'likely significant effects' a proposed development will have on the environment is carried out, where relevant, before development consent is given.

The EIA Directive entered into force in 1985 (Directive 85/337/EEC). It was amended three times (in 1997, 2003 and 2009) and subsequently codified by Directive 2011/92/EU, which was itself amended in 2014 by Directive 2014/52/EU ('the amended Directive'). The EIA Directive is transposed into Irish legislation by the PDA 2000, the PDR 2001 and the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

2.2 Guidelines

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

- EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports;*
- EPA (2003). *Advice Notes on Current Practice in the preparation of Environmental Impact Statement;*
- EC (2017). *Environmental Impact Assessment of Projects. Guidance on the preparation of Environmental Impact Assessment Report*;
- EC (2017). *Environmental Impact Assessment of Projects. Guidance on Scoping*;
- EC (2017). *Environmental Impact Assessment of Projects. Guidance on Screening*;
- Department of Housing, Planning and Local Government (DHPLG) (2018). *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment;*
- DHPLG (2017). Circular letter PL 1/2017 – Advice on Administrative Provisions in Advance of Transposition;
- European Commission (EC) (1999). *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions;*
- EC (2013). *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.*

2.3 The EIA Process

EIA is a process for anticipating the effects on the environment of a proposed development. It is defined in the amended Directive 2014/52/EU as follows:

> *"Environmental impact assessment means a process consisting of:*
>
> *(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);*
>
> *(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;*

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

(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and

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

In this case, 'the developer' refers to the Applicant i.e. Fingal County Council, and 'the competent authority' refers to the planning authority, i.e. An Bord Pleanála in this instance. It is important to emphasise that 'EIA' refers to the overall process of Environmental Impact Assessment, as defined above and illustrated in **Figure 2.1**, below; while the Environmental Impact Assessment Report (EIAR) is the document on which the competent authority's assessment is based. It provides a statement of the effects, if any, which proposed development, if carried out, would have on the environment.

The EIAR is prepared by the Applicant and submitted to the competent authority as part of the development consent process, i.e. as part of the planning application. The competent authority uses the information provided in the EIAR as the basis of an assessment of the environmental effects of the proposed development and, in the context of other considerations, to help determine whether development consent should be granted.

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

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

(a) population and human health;

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC[1] and Directive 2009/147/EC[2];

(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)[3]."

Article 5(1) provides a non-exhaustive list of information that the EIAR shall contain, as follows:

"… the developer shall include at least:

(a) a description of the project comprising information on the site, design, size and other relevant features of the project;

[1] Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora ('the Habitats Directive')
[2] Directive 2009/147/EC on the conservation of wild birds ('the Birds Directive')
[3] Refer to Chapter 20 (Interactions)

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

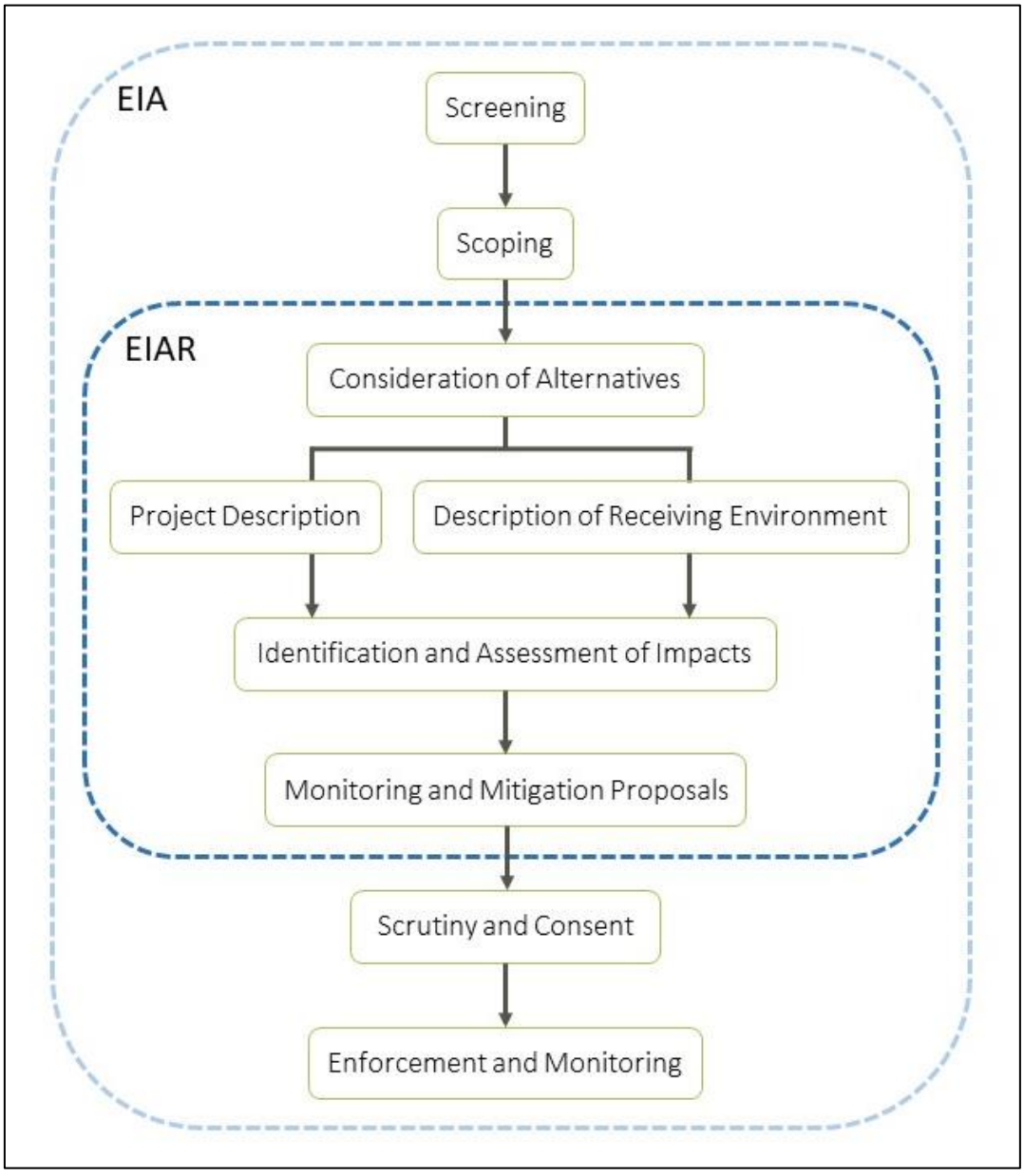
(c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;

(e) a non-technical summary of the information referred to in points (a) to (d); and

(f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."

Figure 2.1 The EIA process (adapted from EPA, 2022)



Where significant effects (as per the definition provided in **Table 1.5**) are identified during the preparation of an EIAR, it may be possible for these to be avoided or minimised through design changes ('mitigation by design') or through the identification of mitigation measures.

The EIA process may be summarised as follows:

- **Screening:** The process of determining whether a proposed development should be subject to EIA;
- **Scoping:** The process of identifying the topics that should be addressed in the EIAR as well as the methods to do so;
- **Description of the receiving environment:** This stage aims to establish a robust baseline (a description of the environmental characteristics of the receiving environment plus any relevant trends in status), utilising a review of existing available information and undertaking surveys and analyses, where appropriate;
- **Impact assessment:** The primary purpose of the EIAR is to identify, describe[4] and present an assessment of the likely significant impacts of a proposed development on the environment;
- **Mitigation:** Where appropriate, mitigation measures are identified to avoid, prevent, reduce or offset any likely significant negative effects identified; as well as any proposed monitoring arrangements;
- **Consultation:** With statutory bodies, the public and other stakeholders, as appropriate;
- **Decision:** The competent authority (Fingal County Council, in this case) decides, in the context of other considerations (including the outcomes of the consultation process), whether development consent should be granted;
- **Implementation / enforcement of conditions of development consent:** Assuming the development is permitted, the schedule of environmental commitments (including the mitigation and monitoring measures set out in the EIAR and any additional environmental conditions of the development consent) needs to be implemented.

2.4 EIA Screening

Screening is the initial stage in the EIA process, where a decision is made as to whether an EIA is required for the development in question.

The amended Directive specifies the classes of project for which an EIA is required by default. In accordance with Article 4(1), all projects listed in Annex I are considered as having significant effects on the environment and shall be subject to EIA. For projects listed in Annex II of the Directive, the Member States may determine whether an EIA is needed, either on the basis of thresholds / criteria or case-by-case examinations. These Annexes have been transposed into Irish law by the provisions of the PDA 2000 and the PDR 2001.

Parts 1 and 2 of Schedule 5 of the PDR 2001 list the classes of development for which EIA is required by default. In Part 1, major project classes (including industrial, chemical, energy, waste, infrastructural and intensive agricultural projects) are identified for the purposes of mandatory EIA. In Part 2, specific thresholds are cited; EIA is a requirement for projects of a class listed here that also meet or exceed the corresponding threshold (e.g. wind farms *"with more than 5 turbines or having a total output greater than 5 megawatts"*).

[4] In accordance with the criteria set out in **Table 1.5** of this EIAR / Table 3.4 of the EPA guidelines

The proposed development is not of a class of development listed in Part 1 of Schedule 5 of the PDR 2001 and, therefore, EIA is not a statutory requirement under this provision. However, the proposed development does correspond with the classes of development listed in paragraphs 10(b)(i) and 10(b)(iv) of Part 2 of Schedule 5 of the PDR 2001. When considered together, the gross quantum of development proposed for Church Fields Housing and Eastern Linear Park Development (permitted under FCC Ref.: Part XI/012/21) and Church Fields East ('proposed development') exceeds the thresholds specified in relation to these classes of development, as detailed in Table 2.1, below.

Table 2.1 Statutory requirement for EIA under Part 2 of Schedule 5 of the PDR 2001

Provision (Part 2 of Schedule 5 of PDR 2001)	Proposed Development (Church Fields East)	Previously permitted development (Church Fields Housing and Eastern Linear Park Development)
Paragraph 10(b)(i): *"Construction of more than 500 dwelling units."*	c. 217 units	300 units
Paragraph 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."*[5]	c. 5.52 Ha	c. 9.47 ha

Therefore, under the provisions of the PDR 2001, EIA is a statutory requirement for the proposed development, and the Applicant is required to prepare an Environmental Impact Assessment Report.

2.5 EIA Scoping

The scoping stage of the EIAR is a process of determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR. Scoping requires the consideration of the nature and likely scale of the potential environmental impacts likely to arise from a proposed development or project. It is an iterative process that is ongoing throughout the development of the EIAR. The following topics, which include those stipulated in the amended Directive, have been scoped in for this assessment:

- Population and Human Health;
- Biodiversity;
- Land, Soils, Geology and Hydrogeology;
- Hydrology;
- Air Quality;
- Climate;
- Noise and Vibration;
- Landscape and Visual;
- Cultural Heritage, Archaeology and Architectural Heritage;
- Microclimate- Daylight and Sunlight;
- Traffic and Transportation;

[5] Where 'business district' refers to a district within a city or town in which the predominant land use is retail or commercial use.

- Material Assets - Waste;
- Material Assets - Services; and
- Interactions between the above-listed topics.

2.5.1 Major Accidents & Disasters

Article 3 of the amended Directive requires that the EIAR *"shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned"*. The objective of this requirement is to ensure appropriate risk management in this case of proposals which *"…because of their vulnerability to major accidents and/or natural disasters (such as flooding, sea level rise, or earthquakes), are likely to have significant adverse effects on the environment"*.

In the absence of national guidance on the assessment of impacts in relation to major accidents and disasters (MADs), the 2020 Institute of Environmental Management and Assessment (IEMA) document, *C in EIA: A Primer*, is referred to. In relation to scoping, the document states that *"A major accidents and/or disasters assessment will be relevant to some developments more than others, and for many developments it is likely to be scoped out of the assessment"* (p. 11). It is further stated that the topic may be scoped out in the event that:

1. There is no source-pathway-receptor linkage of a hazard that could trigger a major accident[6] and / or disaster[7], or potential for the proposed development to lead to a significant environmental effect; or
2. All possible MADs are adequately considered elsewhere in the assessment or covered by existing design measures or compliance with legislation and best practice.

The MADs impact assessment typically includes an assessment of the potential effects in relation to 'Seveso sites', i.e. major industrial establishments, which, because of the presence of certain dangerous substances in sufficient quantities, are regulated under Directive 2012/18/EU (the 'SEVESO III Directive') on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (the 'SEVESO II Directive'). The SEVESO III Directive has been transposed into Irish legislation through the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. No. 209/2015) ('the COMAH Regulations').

The SEVESO III Directive provides that appropriate consultation distances must be put in place for Seveso sites, indicating the area that is liable to be affected by a major accident at the establishment in question; and that technical advice is available to planning authorities in respect of relevant establishments. The Health & Safety Authority (HSA) is the Central Competent Authority responsible for providing such advice, where appropriate, in respect of planning applications that fall within consultation distances of SEVESO sites.

In identifying the locations of Seveso sites in the receiving environment, regard has been had to the *Fingal Development Plan 2023 – 2029*, which show the locations of Seveso sites in the administrative area on their zoning maps. These sites, listed in **Table 2.2**, below, are predominantly clustered at

[6] An event *"… that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage"* (IEMA, 2020, p. 4).
[7] A*"… natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident"* (ibid.).

Damastown / Mulhuddart. The proposed development is c. 920m north-east (linear distance) to the nearest SEVESO III site, Barclay Chemicals Manufacturing Ltd, Damastown Way, Damastown Industrial Park, Mulhuddart, Dublin 15 (upper tier) and is within the Seveso site consultation distance. There is no real likelihood of the proposed development being affected by a MAD associated with any such site. Nor is it likely that the construction or operation of the proposed development would cause or exacerbate a MAD at any such site. Potential impacts related to Seveso sites are, therefore, discounted from further consideration.

Table 2.2 Seveso sites in the Fingal County Council administrative area

Tier	Establishment	Consultation distance[8]	Distance from proposed development
Upper	Barclay Chemicals Manufacturing Ltd (t/a Barclay Crop Protection) Damastown Way, Damastown Industrial Park, Mulhuddart, Dublin 15	1,000 m	920m south-west
	Chemco (Ireland) Limited (t/a Chemsource Logistics) Macetown North, Damastown Industrial Estate, Dublin 15	700 m	1km north-west
	Contract & General Warehousing Ltd Westpoint Business Park, Navan Rd. Mulhuddart, Dublin 15	700 m	1.4km south-west
	Guerbet Ireland ULC Damastown, Mulhuddart, Dublin 15	1,000 m	2.1km west
Lower	Astellas Ireland Co., Ltd Damastown Road, Damastown Industrial Park, Mulhuddart, Dublin 15	1,000 m	1.8km west
	Clarochem Ireland Limited Damastown, Mulhuddart, Dublin 15	1,000 m	2km west
	Exolum Aviation Ireland Ltd (formerly CLH) Corballis Road, Dublin Airport, Co. Dublin	500 m	9.8km north-east
	Gensys Power Ltd. Huntstown Power Station, Huntstown Quarry, Dublin 11	300 m	4km east
	SK Biotek Watery Lane, Swords, Co. Dublin	1,000 m	12km north-east

Considering the nature of the proposed development and its receiving environment, it is considered that there is no source-pathway-receptor linkage of a hazard that could trigger an event constituting a MAD. As such, an assessment of impacts specifically in relation to MADs has been scoped out of this Environmental Impact Assessment Report. However, the risks of feasible accidents and natural events are addressed, where relevant, in the various specialist chapters herein. Flood risk, for instance, is addressed in Chapter 10 (Hydrology) and geohazards are addressed in Chapter 9 (Land, Soils, Geology & Hydrogeology).

2.6 Other Assessments

2.6.1 Appropriate Assessment

European Sites, also known as 'Natura 2000' sites, include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). These are a network of sites designated for nature conservation under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') and Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive'). The requirements for Appropriate Assessment (AA) are set out under Article 6 of the Habitats Directive,

[8] From site perimeter

transposed into Irish law by the European Union (Birds and Natural Habitats) Regulations 2011 – 2021 (the 'Birds and Natural Habitats Regulations') and the PDA 2000.

Article 6(3) of the Habitats Directive states that:

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

The first test is to establish whether, in relation to a particular plan or project, AA is required. Sections 177U of the PDA 2000 requires that the AA screening test must be applied to a proposed development, as follows:

- To assess, in view of best scientific knowledge, if the development, individually or in combination with another plan or project is likely to have a significant effect on the European site; and
- AA is required if it cannot be excluded, on the basis of objective information, that the development, individually or in combination with other plans or projects, will have a significant effect on a European Site.

An Appropriate Assessment Screening Report has been prepared by BSM in respect of the proposed development, in accordance with the requirements of the Habitats Directive and the Birds Directive, and the PDA 2000. It has concluded:

> *"In view of best scientific knowledge, this report concludes that the proposed development at Church Fields East, Mulhuddart, Dublin 15, individually or in combination with another plan or project, will not have a significant effect on any European sites. This conclusion was reached without considering or taking into account mitigation measures or measures intended to avoid or reduce any impact on European sites.*
>
> *It is considered that this report provides sufficient relevant information to allow Fingal County Council to carry out an AA Screening, and to reach a determination that the proposed development will not have any likely significant effects on European sites under Article 6 of the Habitats Directive in light of their conservation objectives."*

Please refer to Appropriate Assessment Screening Report, submitted under separate cover as part of the planning application.

2.6.2 Site Specific Flood Risk Assessment

A Site Specific Flood Risk Assessment (FRA) was undertaken in respect of the proposed development by Waterman Moylan Consulting Engineers Limited, in accordance with the OPW guidelines, "*The Planning Process and Flood Risk Management Guidelines for Planning Authorities"* published in November 2009. A FRA report has been produced, the objective of which is to inform the planning authority in relation to flood risk associated with the proposed development. This section presents a summary of the key findings of that report.

Under the OPW guidelines, residential development is classed as 'highly vulnerable' in terms of flood risk, and should be located in Flood Zone C, where the probability of fluvial flooding is low. Where it is proposed to locate a highly vulnerable development in Flood Zones A or B, a justification test is required.

The FRA considers the following components in the identification and assessment of flood risk- tidal, fluvial, pluvial, groundwater and human / mechanical error. Each component has been investigated using a source, pathway and receptor model, followed by an assessment of the likelihood of a flood occurring and the possible consequences.

The proposed site is outside of the 0.1% AEP (1 in 1,000 year) flood event for both fluvial and coastal flooding. Therefore, the site can be classified as Flood Zone C and is suitable for development.

The following are flood risk management strategies proposed to minimise the risk of pluvial flooding:

- Surcharging of the proposed on-site drainage systems- The risk of flooding the proposed buildings is minimised with adequate sizing of the on-site surface water network and SUDS devices such as, flow restrictions, storage tanks etc. The risk from any surcharged surface water is also reduced due to finished floor levels being above the adjacent road levels and with overland flood routing incorporated into the development.
- Surcharging from the existing surrounding drainage systems- The risk from flooding the proposed buildings from surcharging of the existing surface water network is reduced by setting finished floor levels of the buildings above the adjacent road levels and with overland flood routing along the road network.
- Surface water discharging from the subject site- Surface water discharging from the development will be limited by a hydrobrake flow restriction device to ensure the maximum discharge rate from the site is limited to 3.7 l/s/Ha, as agreed with Fingal County Council as part of the site strategy plan. Excess discharge flows from the development will be attenuated in the detention pond and stone tank system as indicated in the Engineering Assessment Report.
- Overland flooding from surrounding areas- The risk from overland flooding from surrounding areas is low due to the finished buildings/ floor levels, being set 500mm above the top water level of the attenuation system in the 1:100 year storm and between 150mm and 300mm higher than the surrounding area.
- Overland flooding from the subject site- The risk is minimised by providing overland flooding through the development with raised finished floor levels, generally between 150mm and 300mm above the adjacent road network.

The FRA has concluded that the proposed flood risk mitigation measures, if implemented, are sufficient to provide a suitable level of protection to the proposed development. For further information, refer to standalone FRA report, submitted under separate cover. Refer also to Chapter 10 (Hydrology).

3 Planning & Development Context

3.1 Introduction

This Chapter sets out the policy in relation to proper planning and sustainable development in the context of the proposed development. It has been prepared by Namrata Kaile, Ecologist & Environmental Consultant at Brady Shipman Martin (BSM). A technical review was completed by Thomas Burns, Partner at BSM. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

The following policy documents of relevance are discussed in relation to the proposed development herein:

International

- United Nations Sustainable Development Goals (2015).

European

- Environmental Impact Assessment Directive (consolidated 2011/92/EU and 2014/52/EU);
- Birds (2009/147/EC) and Habitats Directive (92/43/EEC);
- EU Water Framework Directive (2000).

National

- Project Ireland 2040 – National Planning Framework and National Development Plan (2018);
- Sustainable Urban Housing: Design Standards for New Apartments (2022);
- Urban Development and Building Heights – Guidelines for Planning Authorities (2018);
- Design Manual for Urban Roads and Streets (2019);
- Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (2010);
- Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009);
- Urban Design Manual – A Best Practice Guide (2009);
- The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009);
- Childcare Facilities – Guidelines for Planning Authorities (2001);
- Affordable Housing Act 2021 (as amended);
- Housing for All – A New Housing Plan for Ireland (2021);
- National Cycle Manual (2011);
- Smarter Travel – A Sustainable Transport Future 2009 – 2020.

Regional

- Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019 – 2031;
- Fingal Development Plan 2023-2029;
- Greater Dublin Area Transport Strategy 2022-2042.

Topic-specific policies are addressed, where appropriate, in the relevant specialist chapters of this EIAR.

3.2 International Policy Context

3.2.1 United Nations Sustainable Development Goals (2015)

The United Nations' (UN) 17 Sustainable Development Goals (SDGs) provide a *"shared blueprint for peace and prosperity for people and the planet, now and into the future"* (**Figure 3.1**). They were adopted by the UN Member States – including Ireland – in 2015, as part of the adoption of the *2030 Agenda for Sustainable Development*. These high-level goals frame and inform Irish national agendas and policies to 2030, including (but not limited to) *Project Ireland 2040* (*National Planning Framework* and *National Development Plan*) and the Eastern and Midland Regional Assembly's *Regional Spatial and Economic Strategy*, discussed below.

Figure 3.1 United Nations sustainable development goals (SDGs)

3.3 European Policy Context

3.3.1 Environmental Impact Assessment Directive (consolidated 2011/92/EU and 2014/52/EU)

Environmental Impact Assessment (EIA) is a procedure under the terms of European Directives on the assessment of the effects of certain public and private projects on the environment. The EIA Directive (2014/52/EU) became applicable in Ireland from May 16th, 2017, and amends Directive 2011/92/EU. The EIA Directive(s) have been transposed into Irish legislation by the PDA 2000 and the PDR 2001. The most recent 2014 EIA Directive has been transposed into Irish Legislation, through the European Union (Planning and Development) (Environmental Impact Assessment) Regulations (S.I. 296 of 2018) which came into effect on 1 September 2018 and the EIAR has been prepared in accordance with these Regulations. Projects for which an EIA is mandatory under Annex I of the Directive have been listed under Part 1 of Schedule 5 of the PDR 2001. Similarly, Part 2 of Schedule 5 outlines thresholds for other projects which also require EIA, as per Annex II of the Directive. In addition, a 'sub-threshold' EIA may be required, if the Planning Authority determines that the development would be likely to have significant effects on the environment. Schedule 7 of the Regulations details the criteria for determining whether a development would or would not be likely to have significant effects on the environment

considering the characteristics of the proposed development, its location and characteristics of potential impacts.

As detailed in Section 2 of this EIAR, the proposed development is not of a class of development listed in Part 1 of Schedule 5 of the PDR 2001 and, therefore, EIA is not a statutory requirement under this provision. However, the proposed development does correspond with the classes of development listed in paragraphs 10(b)(i) and 10(b)(iv) of Part 2 of Schedule 5 of the PDR 2001 and exceeds the thresholds specified in relation to these classes of development when cumulatively assessed with the recently permitted Church Fields Housing and Eastern Linear Park development. Therefore, under the provisions of the Part 2 of Schedule 5 of the PDR 2001, EIA is a statutory requirement for the proposed development.

3.3.2 Birds (2009/147/EC) and Habitats Directive (92/43/EEC)

Adopted in 1992, the Council Habitats Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. It forms the cornerstone of Europe's nature conservation policy with the Birds Directive 2009/147/EC and establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments.

Please refer to Section 2.6.1 and the Appropriate Assessment Screening Report, submitted under separate cover as part of the planning application, for full details.

3.3.3 EU Water Framework Directive (2000/60/EC)

The Water Framework Directive (WFD) established a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater with the objective to protect and improve water quality in all waters to achieve good ecological status by 2015 or, at the latest, by December 2027.

Specifically, the WFD aims to:

- Prevent further deterioration and protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;
- Promote sustainable water use based on a long-term protection of available water resources;
- Enhanced protection and improvement of the aquatic environment, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of priority hazardous substances;
- Ensure the progressive reduction of pollution of groundwater and prevents its further pollution; and
- Contribute to mitigating the effects of floods and droughts.

The Water Framework Directive is linked to a number of other EU directives in several ways. These include Directives relating to the protection of biodiversity (Birds and Habitats Directives), directives related to specific uses of waters (drinking water, bathing waters and urban wastewater directives) and to directives concerned with the regulation of activities undertaken in the environment (Industrial Emissions and Environmental Impact Assessment directives). More recent directives on topics such as

Floods and the Marine Strategy Framework have significant linkages with the WFD which is also supplemented by the Priority Substances Directive and the Groundwater Directive.

EU member states are required to implement the WFD through River Basin Management Plans (RBMPs). Ireland's approach to water quality management has developed over the first and second RBMPs and will continue to evolve into the third cycle RBMP 2022 – 2027 to protect and improve water quality nationally and locally.

The proposed development has considered the current water status of all relevant water bodies, and potential impacts have been considered in Chapter 9 Land, Soils, Geology and Hydrogeology and Chapter 10 Hydrology of this EIAR. With mitigation measures in place, it is concluded there will be no degradation of the current water body or any impact on its potential to meet the requirements and / or objectives of the RBMPs.

3.4 National Policy Context

3.4.1 Project Ireland 2040

Project Ireland 2040 is the Government's overarching planning and development policy for the country to 2040. It constitutes a *"strategy to make Ireland a better country for all of its people"* by setting public investment policy at a high level. It comprises two documents: the *National Planning Framework* (NPF), which details the strategy for development to 2040; and the *National Development Plan* (NDP), which outlines the Government's investment strategy and budget for the period 2021-2030 and identifies priority future projects.

The NPF is the Government's high-level strategic plan for shaping the future growth and development of Ireland to 2040. It is a framework to guide public and private investment to create and promote opportunities, and to protect and enhance the environment. At its core are ten National Strategic Outcomes (NSOs), *"a shared set of goals for every community across the country"* (p. 10), which the plan aims to deliver. With a view to achieving these NSOs, the NPF identifies a suite of National Policy Objectives (NPOs). The ten NSOs are as follows:

1. Compact Growth
2. Enhanced Regional Accessibility
3. Strengthened Rural Economies and Communities
4. Sustainable Mobility
5. A Strong Economy, supported by Enterprise, Innovation and Skills
6. High-quality International Connectivity
7. Enhanced Amenity and Heritage
8. Transition to a Low Carbon and Climate Resilient Society
9. Sustainable Management of Water and other Environmental Resources
10. Access to Quality Childcare, Education and Health Services

The objectives of the NPF seek to address ongoing negative development trends, including sprawling peri-urban growth, stagnation of inner-city and old suburban areas, and loss of farmland and habitats to greenfield development.

The NPF identifies that, by 2040, it is expected that an additional one million people will live in Ireland. The Government predicts that there will be a need for at least half a million additional homes by 2040.

In accordance with the policy of compact growth, the NPF aims to prioritise the provision of new homes in cities and larger towns, targeting 40% of housing development within and close to the existing footprint of built-up areas.

The Government's long term vision for Ireland's housing future aims to balance the provision of good quality housing that meets the needs of a diverse population, in a way that makes our cities, towns, villages and rural areas good places to live now and in the future. The NPF sets out national core principles to guide the delivery of future housing at all levels of governance, as follows (p. 91):

- Ensure a high standard quality of life to future residents as well as environmentally and socially sustainable housing and place-making through integrated planning and consistently excellent design;
- Allow for choice in housing location, type, tenure and accommodation in responding to need;
- Prioritise the location of new housing provision in existing settlements as a means to maximising a better quality of life for people through accessing services, ensuring a more efficient use of land and allowing for greater integration with existing infrastructure;
- Tailor the scale and nature of future housing provision to the size and type of settlement where it is planned to be located;
- Integrate housing strategies where settlements straddle boundaries (county and / or regional);
- Utilise existing housing stock as a means to meeting future demand.

The NPF requires homes to be located in places that can support sustainable development; i.e. places that are served by existing infrastructure and a range of local services; and which can encourage the use of public transport, walking and cycling, in order to promote more efficient and low-carbon development. It is noted that Ireland's future homes will *"still be located in our smaller towns, villages and rural areas, including the countryside, but at an appropriate scale that does not detract from the capacity of our larger towns and cities to deliver homes more sustainably"* (p. 92).

In the Eastern and Midland region, the NPF targets population growth of 490,000 – 540,000 additional people by 2040. In order to delivery compact, smart and sustainable growth, the NPF intends for 50% of new housing development in the region to be delivered in the existing footprint of Dublin City and suburbs, with an additional 30% delivered elsewhere, within existing urban footprints.

The proposed development is broadly consistent with the objectives of the NPF in that it will deliver a high-quality residential development within the Dublin Metropolitan area. While the proposed development will be delivered on a greenfield site at the margin of an existing settlement, it is situated on lands that have been earmarked by the Local Authority (Fingal County Council) for residential development of this nature. As mentioned in previous sections, the surrounding area is a relatively new suburban area comprising a mix of uses from residential to commercial. Vehicular access to the site is proposed via the permitted Church Fields Part 8 scheme to the west. Pedestrian and cycle links also connect the new development to the surrounding residential areas. All roads are designed to the standards as set out in Design Manual for Urban Roads and Streets (DMURS 2019).

The Planning Report for the proposed development, prepared by BSM and submitted under separate cover as part of the planning application, details the consistency of the proposed development with the NPOs.

3.4.2 Sustainable Urban Housing: Design Standards for New Apartments (2022)

The *Design Standards for New Apartments* were published by the Minister for Housing, Planning & Local Government in March 2015. They were subsequently updated in December 2020 and in December 2022.

The Guidelines note that the NPF projects a need for a minimum of 550,000 new homes, at least half of which are targeted for provision in Ireland's five cities and of particular relevance to this site it notes a shift in Government policy towards securing more compact and sustainable urban development, to enable people to live nearer to where jobs and services are located, which requires at least half of new homes within Ireland's cities to be provided within the current built-up area of each, i.e. on sites within the existing urban 'envelope'.

Since the publication of the Guidelines in 2015, the guidelines were subsequently amended in 2018 and 2020, particularly with regard to design quality safeguards such as internal space standards for 1, 2, or 3 bedroom apartments, floor to ceiling height, internal storage and amenity space and shared accommodation/co-living. A key update as a result of these amendments is the ability to reduce car parking standards. The most recent update of the Guidelines, published in December 2022, included significant changes in respect of Build to Rent (BTR) developments. Whilst not removing it completely, BTR is now no longer considered to be a distinct development type and all design standards must be in accordance with Appendix 1 of the Guidelines, as per all standard apartment development.

In order to give effect to their objectives, the guidelines set out specific planning policy requirements (SPPRs), to which planning authorities must have regard; notwithstanding objectives and requirements of development plans, local area plans and Strategic Development Zone (SDZ) planning schemes. The guidelines set out requirements in relation to various apartment design parameters, including locational considerations, unit mix, internal dimensions, dual aspect ratios, amenity spaces, community facilities and parking, among others.

The guidelines identify intermediate urban locations, generally suitable for smaller-scale, higher density development that may wholly comprise apartments, or alternatively, medium-high density residential development of any scale that includes apartments to some extent, including:

1. Sites within or close to, i.e. within reasonable walking distance (i.e. up to 10 minutes or 800 – 1,000 m), of principal town or suburban centres or employment locations, that may include hospitals and third level institutions;
2. Sites within walking distance (i.e. between 10 – 15 minutes or 1,000 – 1,500 m) of high capacity urban public transport stops (such as DART, commuter rail or Luas) or within reasonable walking distance (i.e. between 5 – 10 minutes or up to 1,000 m) of high frequency (i.e. min. 10 minute peak hour frequency) urban bus services or where such services can be provided;
3. Sites within easy walking distance (i.e. up to 5 minutes or 400 – 500 m) of reasonably frequent (min. 15 minute peak hour frequency) urban bus services.

It is noted that *"The range of locations is not exhaustive and will require local assessment that further considers these and other relevant planning factors"*.

The Planning Report for the proposed development, prepared by BSM and submitted under separate cover as part of the planning application, details the consistency of the proposed development with the SPPRs of the guidelines.

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

The Urban Development and Building Heights Guidelines for Planning Authorities (UD&BHGs) were published in December 2018 by the Minister for Housing, Planning & Local Government. They have been published to support the strategic policy framework set out in Project Ireland 2040 and objectives of the NPF, by securing a more compact and sustainable manner of development in urban areas. They set out SPPRs to which planning authorities must have regard.

The guidelines set out the Government's policy in relation to the spatial distribution of housing in Ireland. They state that Ireland's traditional settlement pattern of sprawling low-rise suburban development is *"completely unsustainable"*, creating demand for new infrastructure, resulting in the loss of greenfield land, and locking in travel patterns that are environmentally and socially unsustainable. The guidelines instead promote the building up and consolidation of existing urban areas, through a combination of brownfield and infill development and increased building heights.

The guidelines state that:

> *"While achieving higher density does not automatically and constantly imply taller buildings alone, increased building height is a significant component in making optimal use of the capacity of sites in urban locations where transport, employment, services or retail development can achieve a requisite level of intensity for sustainability."*

Under the scope of the 'development management principles', it is further stated that:

> *"In relation to the assessment of individual planning applications and appeals, it is Government policy that building heights must be generally increased in appropriate urban locations. There is therefore 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 relation to building heights in suburban and edge locations in cities and towns, the guidelines note that new residential developments in these areas typically now include townhouses (of two to three storeys), duplexes (of three to four storeys) and apartments (of four storeys and upwards), delivering medium densities of 35 – 50 dwellings per hectare.

The guidelines state that:

> *"Such development patterns are generally appropriate outside city centres and inner suburbs, i.e. the suburban edges of towns and cities, for both infill and greenfield development and should not be subject to specific height restrictions. Linked to the connective street pattern required under the Design Manual for Urban Roads and Streets (DMURS), planning policies and consideration of development proposals must move away from a 2-storey, cul-de-sac dominated approach, returning to traditional compact urban forms which created our finest town and city environments."*

The Planning Report for the proposed development, prepared by BSM and submitted under separate cover as part of the planning application, details the consistency of the proposed development with the SPPRs of the guidelines.

3.4.4 Design Manual for Urban Roads and Streets

The Design Manual for Urban Roads and Streets (DMURS), was adopted by the Department of Transport and the Department of Environment in 2013 and has been updated in 2019. In June 2022, NGS Circular 1 of 2022 issued updates in relation to Advice Note 2 on Materials and Specifications. DMURS sets out design guidance and standards for new / reconfigured urban roads and streets in Ireland. It also outlines practical design measures to encourage more sustainable travel patterns in urban areas.

The DMURS Statement of Consistency, prepared by Waterman Moylan and submitted under separate cover as part of the planning application, provides further detail in respect of the compliance of the proposed project with DMURS.

3.4.5 Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (2010)

The Natura 2000 network is a pan-European Union network which provides for the protection of sites that are of particular importance for rare, endangered or vulnerable habitats and species. The Natura 2000 network in Ireland is comprised of Special Areas of Conservation (SAC) and Special Protection Areas (SPA). SAC are selected for the conservation and protection of habitats listed on Annex I and species (other than birds) listed on Annex II of Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('the Habitats Directive'), and their habitats. SPA are sites that have been selected and notified for the conservation and protection of bird species listed on Annex I of Directive 2009/147/EC on the conservation of wild birds ('the Birds Directive') and regularly occurring migratory species, and their habitats, particularly wetlands.

Appropriate Assessment (AA) examines the direct and indirect impacts that a plan or project might have, on its own or in combination with other plans and projects, on one or more Natura 2000 sites in view of their conservation objectives. The obligation to undertake AA derives from Articles 6(3) and 6(4) of the Habitats Directive. The requirements of the Habitats Directive in relation to AA are similar in many respects to those associated with EIA. However, the focus of AA is targeted specifically on Natura 2000 sites and their conservation objectives. Additionally, Articles 6(3) and 6(4) place strict legal obligations on Member States, with the outcome of AA fundamentally affecting the decision of whether or not to grant development consent.

The Ministerial guidelines in relation to AA of plans and projects were published by the Minister for Environment, Heritage and Local Government in December 2009, and subsequently revised in February 2010. Their purpose is to assist and guide local and planning authorities in the application of Articles 6(3) and 6(4) of the Habitats Directive insofar as it relates to their roles, functions and responsibilities in the undertaking of AA of plans and projects.

An AA Screening Report has been prepared by BSM in respect of the proposed development, in accordance with the requirements of the Habitats Directive and the Birds Directive, the European Union (Birds and Natural Habitats) Regulations 2011 – 2021 and the PDA 2000.

Please refer to Section 2.6.1 and the Appropriate Assessment Screening Report, submitted under separate cover as part of the planning application, for full details.

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

The aim of these guidelines is to set out the key planning principles guiding the delivery of residential development in urban areas in Ireland. They establish core principles of urban design, with a view to creating urban places of high quality and distinct identity. They recommend that planning authorities should promote high quality design in their policy documents and in their development management processes. The Guidelines are accompanied by a non-statutory *Urban Design Manual*, which is discussed in the following section. Their objective is to produce high-quality, sustainable residential developments *"where people actually want to live, to work and to raise families"*.

The guidelines set out a series of high-level aims for successful and sustainable residential development in urban areas, as follows:

- Prioritise walking, cycling and public transport, and minimise the needs to use cars;
- Deliver a quality of life which residents and visitors are entitled to expect, in terms of amenity, safety and convenience;
- Provide a good range of community and support facilities, where and then they are needed and that are easily accessible;
- Present an attractive, well maintained appearance, with a distinct sense of place and a quality public realm that is easily maintained;
- Are easy to access for all and to find one's way around;
- Promote the efficient use of land and of energy, and minimise greenhouse gas emissions;
- Provide a mix of land uses to minimise transport demand;
- Promote social integration and provide accommodation for a diverse range of household types and age groups;
- Enhance and protect the green infrastructure and biodiversity; and
- Enhance and protect the built and natural heritage.

The guidelines also state that sustainable neighbourhoods should be guided by the principle of universal design. The guidelines emphasise the importance of sustainable settlement patterns through the provision of higher densities of residential development on lands within existing or planned transport corridors i.e., within 500m of a bus stop, or within 1km of a light rail stop or rail station.

Section 5.11 of the Guidelines promotes a net residential density range in the order of 35-50 dwellings per hectare for 'Outer Suburban/Greenfield sites'. Section 5.8 refers to sites proximate to public transport corridors and states "*It is recommended that increased densities should be promoted within 500 metres walking distance of a bus stop, or within 1km of a light rail stop or a rail station. The capacity of public transport (e.g. the number of train services during peak hours) should also be taken into consideration in considering appropriate densities."*

The Planning Report for the proposed development, prepared by BSM and submitted under separate cover as part of the planning application, details the consistency of the proposed development with the guidelines.

3.4.7 Urban Design Manual – A Best Practice Guide (2009)

The *Urban Design Manual* accompanies the Department's 2009 Guidelines on *'Sustainable Residential Development in Urban Areas'*, as described above. It provides best practice guidance on the practical implementation of the policies contained in those guidelines. The core aim of the Manual is to provide

developers, designers and planners with the information and support they need to improve the design quality and sustainability of the development schemes with which they are involved. It focuses primarily on the issues presented in housing schemes in the 30 – 50 units per hectare range but also addresses some of the specific issues generated by higher and lower density developments.

The Manual is based around 12 criteria for sustainable residential development, under the headings of 'neighbourhood', 'site', and 'home', as follows:

Neighbourhood

- Context – How does the development respond to its surroundings?
- Connections – How well connected is the new neighbourhood?
- Inclusivity – How easily can people use and access the development?
- Variety – How does the development promote a good mix of activities?

Site

- Efficiency – How does the development make appropriate use of resources, including land?
- Distinctiveness – How do the proposals create a sense of place?
- Layout – How does the proposal create people friendly streets and spaces?
- Public Realm – How safe, secure and enjoyable are the public areas?

Home

- Adaptability – How will the buildings cope with change?
- Privacy & Amenity – How does the scheme provide a decent standard of amenity?
- Parking – How will the parking be secure and attractive?
- Detailed Design – How well thought through is the building and landscape design?

The Manual recommends that these criteria be used in the assessment of residential planning applications. It identifies areas where conflicts may arise between particular criteria, stating that *"Certain issues have been identified where it may be necessary to find a balance between potentially conflicting design objectives"* (p. 9).

These criteria have been given due consideration in the design of the proposed development. Please refer to the Planning Report, prepared by BSM and submitted as part of the planning application under separate cover, for a more detailed discussion of how the proposed development aligns with the above-listed criteria.

3.4.8 The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009)

The *Planning System and Flood Risk Management – Guidelines for Planning Authorities* was published by the Office of Public Works (OPW) and Department of Environment, Heritage and Local Government in 2009. The guidelines introduce comprehensive mechanisms for the incorporation of flood risk identification, assessment and management into the planning process. They aim to, among other things; avoid inappropriate development in areas at risk of flooding, and avoid new developments increasing flood risk elsewhere. They mandate the preparation of Site Specific Flood Risk Assessments (FRA) for development applications which relate to areas at risk of flooding, and stipulate the content and level of detail to be presented therein.

It is noted that, in accordance with the findings of the Strategic Flood Risk Assessment carried out in respect of the *Fingal Development Plan 2023 – 2029*, it is an objective of the Development Plan (Objective IUO16, p. 417) to:

> *"Have regard to the OPW Flood Risk Management Guidelines 2009, as revised by Circular PL 2/2014, when assessing planning applications and in the preparation of statutory and non-statutory plans and to require site specific flood risk assessments are to be considered for all new developments within the County. All development must prepare a Stage 1 Flood Risk Analysis and if the flooding risk is not screened out, they must prepare a Site-Specific Flood Risk Assessment (SSFRA) for the development, where appropriate."*

A SSFRA was undertaken in respect of the proposed development by Waterman Moylan Consulting Engineers Limited, in accordance with the OPW guidelines. A FRA report has been produced, the objective of which is to inform the planning authority in relation to flood risk associated with the proposed development. This section presents a summary of the key findings of that report.

The SSFRA has concluded that the proposed flood risk mitigation measures, if implemented, are sufficient to provide a suitable level of protection to the proposed development. For further information, refer to standalone Section 2.6.2 and the SSFRA report, submitted under separate cover. Refer also to Chapter 10 (Hydrology).

3.4.9 Childcare Facilities – Guidelines for Planning Authorities (2001)

The *Childcare Facilities – Guidelines for Planning Authorities* were published by the Government in 2001. They provide a framework to guide both local authorities in preparing development plans and assessing applications for planning permission, and developers and childcare providers in formulating development proposals. They state the Government policy on childcare provision, which is *"to increase the number of childcare places and facilities available and to improve the quality of childcare services for the community"* (p. 3).

The guidelines indicate that Development Plans should facilitate the provision of childcare facilities in appropriate locations. These include larger new housing estates, where planning authorities should require the provision of a minimum of one childcare facility (with 20 places) for every 75 dwellings.

However the *Sustainable Urban Housing: Design Standards for New Apartments* (Department of Housing, Local Government and Heritage, 2022) state that:

> *"Notwithstanding the Planning Guidelines for Childcare Facilities (2001), in respect of which a review is to be progressed, and which recommend the provision of one child-care facility (equivalent to a minimum of 20 child places) for every 75 dwelling units, the threshold for provision of any such facilities in apartment schemes should be established having regard to the scale and unit mix of the proposed development and the existing geographical distribution of childcare facilities and the emerging demographic profile of the area. One-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and subject to location, this may also apply in part or whole, to units with two or more bedrooms"*. (p. 33)

A Social Infrastructure and Childcare Demand Report has been prepared by BSM and is submitted as part of the planning application under separate cover. It has assessed existing and permitted social and community infrastructure in the area in light of the proposed development.

3.4.10 Affordable Housing Act 2021 (as amended)

The Affordable Housing Act provides for the following:

- The provision of dwellings for the purpose of sale under affordable dwelling purchase arrangements;
- To provide for the provision by housing authorities of financial assistance to purchase dwellings under affordable dwelling purchase arrangements;
- To provide for dwellings to be made available on a cost rental basis;
- To provide for funding to be made available for the purchase of dwellings in accordance with a scheme of shared equity.

The proposed development provides for a total of 217 no. units comprising 96 no. apartments and 121 no. houses in a mixed tenure scheme. Please refer to the Planning Report, prepared by BSM and submitted as part of the planning application under separate cover, for a more detailed discussion of how the proposed development aligns with the Act.

3.4.11 Housing for All – A New Housing Plan for Ireland (2021)

Housing for All, published in September 2021, published by Department of Housing, Local Government and Heritage is the Government's new housing plan to 2030. It provides an overview of the existing housing scenario as follows:

- There are not enough houses to buy or rent in the private sector;
- There are not enough houses being built by the State for those who need social housing;
- Housing has become increasingly unaffordable for the 'squeezed middle' who would once have expected to be able to purchase their own home;
- Too many people are experiencing homelessness or are unable to access appropriate housing;
- The cost of building housing is too high;
- Too much vacant housing stock remains unused;
- Our housing stock needs to be more environmentally friendly.

The overarching aim of the Housing for All plan is that *"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"* (p. 17). With a view to achieving this aim, the plan sets out four overarching housing policy objectives as follows:

1. Supporting homeownership and increasing affordability;
2. Eradicating homelessness, increasing social housing delivery and supporting social inclusion;
3. Increasing new housing supply; and
4. Addressing vacancy and efficient use of existing stock.

A suite of actions are set out under the four above-listed headings. The *Housing for All* plan allocates a housing budget of in excess of €20 bn through the Exchequer, the Land Development Agency (LDA) and the Housing Finance Agency over the next five years. According to the plan, this constitutes the largest housing budget in the history of the State.

The plan provides for the following key targets / actions, among others:

- Increased supply of new housing overall, up to an average of at least 33,000 per year to 2030;
- An average of 6,000 affordable homes to be made available every year for purchase or for rent;

- Provision of more than 10,000 social homes each year, with an average 9,500 new-build Social Housing Homes to 2026;
- Increased contribution by developers under Part V, up from 10% to 20%, to include affordable housing and cost rental housing.

The estimates of housing demand which form the basis of the *Housing for All* plan's targets have been developed by the Department of Housing, Local Government and Heritage (DHLGH)'s Housing Need and Demand Assessment (HNDA) model, which has been adapted from the Scottish HNDA. The HNDA tool has been used to project the future need for housing in Ireland by tenure type (**Table 3.1**).

Table 3.1 DHLGH HNDA annual housing demand projections to 2030

Tenure Type	Annual Need
New private ownership	11,800
New private rental	6,500
New affordable ownership	4,100
New social housing	10,300
Total	*32,700*

The plan seeks to ensure that new housing is delivered in an environmentally sustainable manner, with a greater proportion of residential development in the existing built-up footprint of towns and cities, and all new homes being built to Nearly Zero Energy Building (NZEB) standards, as well as a policy of retrofitting existing housing stock.

The proposed development is consistent with the Government's New Housing for All plan, in that it will provide approx. 217 no. new, high-quality homes on appropriately zoned lands.

3.4.12 National Cycle Manual (2011)

The National Cycle Manual was published by the National Transport Authority (NTA) in 2011 with a view to improving the cycling infrastructure in urban environments, and encouraging more people to cycle. It provides guidance on the integration of the bicycle into the design of urban areas.

To the east of the proposed development, a cycle track (immediate west of the Church Road and the treeline) is currently under construction, as per the Greater Dublin Area Transport Strategy (Cycle Network) 2022-2042. The cycle network is also provided on the Damastown Avenue and will be provided on the link road (under construction) between Damastown Avenue and Avondale Place / Wellview Avenue. The proposed development will connect into these existing cyclists facilities, designed in accordance with the DMURS (2013) and the National Cycle Manual. For further information in this regard, refer to the DMURS Statement of Consistency and Traffic and Transport Assessment prepared by Waterman Moylan Consulting Engineers Limited and submitted under separate cover as part of the planning application.

3.4.13 Smarter Travel – A Sustainable Transport Future 2009 – 2020

Smarter Travel – A Sustainable Transport Future (2009 – 2020) outlines the Government's goals to achieve transport sustainability as follows:

1. Reduce overall travel demand;
2. Maximise the efficiency of the transport network;
3. Reduce reliance on fossil fuels;

4. Reduce transport emissions; and
5. Improve accessibility to transport.

The aims that the Smarter Travel policy sets out in order to achieve these goals are as follows:

- Future population and employment growth will predominantly take place in sustainable compact forms, which reduce the need to travel for employment and services;
- 500,000 more people will take alternative means to commute to work to the extent that the total share of car commuting will drop from 65% to 45%;
- Alternatives such as walking, cycling and public transport will be supported and provided to the extent that these will rise to 55% of total commuter journeys to work;
- The total kilometres travelled by the car fleet in 2020 will not increase significantly from current levels;
- The road freight sector will become more energy efficient , with a subsequent reduction in emissions;
- A reduction on current levels of emissions will be achieved for greenhouse gas emissions from the transport sector.

Various aspects of the design of the proposed development (e.g. provision of secure bike stores, and dedicated pedestrian and cycle routes) will facilitate walking and cycling among residents and visitors. The design of the internal road and street layout is consistent with the DMURS and National Cycle Manual.

The proposed development is situated in a peri-urban area in a town in Co. Dublin. Relative to more centrally located urban residential development (e.g. in Dublin City centre), the proposed development may be expected to rely on a higher proportion of private car use, particularly for commutes to-and-from workplaces. However, the location of the proposed development is served by accessible, high-capacity public transport infrastructure, in the form of the Dublin bus service serving the town, a c. 700m from the proposed development site.

For further information, refer to Chapter 17 (Traffic & Transportation). Also, refer to the Planning Report, prepared by BSM and submitted as part of the planning application under separate cover.

3.5 Regional Policy Context

3.5.1 Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019 – 2031

There are three administrative Regions in Ireland: the Northern and Western Region, the Southern Region, and the Eastern and Midland Region and under national policy, Regional Assemblies are tasked with drafting Regional Spatial and Economic Strategies (RSESs). The primary statutory objective of the Strategy is to support implementation of Project Ireland 2040 and its accompanying documents-National Planning Framework and National Development Plan to provide a long-term strategic planning and economic framework for the Region to 2031. The proposed development is situated in the Eastern and Midland Region, which takes in Counties Longford, Westmeath, Offaly, Laois, Louth, Meath, Kildare, Wicklow and Dublin. The Region is the smallest in terms of land area but the largest in population size and is identified as the *"economic engine of the state"* because it contains the capital city (p. 14).

The current RSES for the Region was published in 2019. The RSES' vision statement for the Region is as follows:

> *"To create a sustainable and competitive Region that supports the health and wellbeing of our people and places, from urban to rural, with access to quality housing, travel and employment opportunities for all."* (p. 6)

The RSES is based on three key principles:

1. **Healthy Placemaking:** To promote people's quality of life through the creation of healthy and attractive places to live, work, visit and study in;
2. **Climate Action:** The need to enhance climate resilience and to accelerate a transition to a low carbon economy recognising the role of natural capital and ecosystem services in achieving this;
3. **Economic Opportunity:** To create the right conditions and opportunities for the region to realise sustained economic growth and employment that ensures good living standards for all.

Under the headings of these three principles, the RSES sets out 16 Regional Strategic Outcomes (RSOs), which are closely aligned with the NPF's NSOs and the United Nations' SDGs. With a view to realising the RSOs, the RSES sets out a suite of Regional Policy Objectives (RPOs) to guide the development of the Region.

Healthy Placemaking

- Sustainable Settlement Patterns;
- Compact Growth & Urban Regeneration;
- Rural Communities;
- Healthy Communities;
- Creative Places.

Climate Action

- Integrated Transport & Land Use;
- Sustainable Management of Water, Waste and other Environmental Resources;
- Build Climate Resilience;
- Support the Transition to Low Carbon and Clean Energy;
- Enhanced Green Infrastructure;
- Biodiversity & Natural Heritage.

Economic Opportunity

- A Strong Economy supported by Enterprise & Innovation;
- Improve Education, Skills & Social Inclusion;
- Global City Region;
- Enhanced Regional Connectivity;
- Collaboration Platform.

The RSES subdivides the Region into 'functional urban areas' (FUA) based on commuting patterns, as follows:

- The Dublin Metropolitan Area (DMA);
- The Core Region; and
- The Gateway Region.

The site of the proposed development is situated on the north-western margin of the DMA, which is defined as the continuous built-up city area and a number of highly urbanised surrounding settlements within a polycentric metropolitan area. The RSES contains a Metropolitan Area Strategic Plan (MASP) for the DMA, which is discussed in relation to the proposed development below.

The RSES contains a Growth Strategy for the Region, which supports *"the continued growth of Dublin as our national economic engine"* (p. 26) and is supported by a Settlement Strategy and Economic Strategy. A key challenge in terms of housing provision in the Region is identified as *"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"* (p. 17).

The RSES's strategy of compact growth is reflected in RPO 3.2, which states that *"Local authorities, in their core strategies shall set out measures to achieve compact urban development targets of at least 50% of all new homes within or contiguous to the built up area of Dublin city and suburbs and a target of at least 30% for other urban areas"* (p. 39).

In relation to travel patterns in the Region, the RSES notes that:

> *"The commuter catchment of the Dublin Metropolitan Area now extends into parts of the Midlands, Louth and south into Wexford. While Dublin has higher rates of sustainable transport, private vehicles remain the primary mode of travel to work or education across the whole of the region. Long distance car-based commuting is a key challenge that is leading to congestion of transport networks and negative impacts on people's quality of life and on the environment."*

The RSES sets out guiding principles for the integration of land use and transport, including the following (p. 187):

- *"For urban-generated development, the development of lands within or contiguous with existing urban areas should be prioritised over development in less accessible locations. Residential development should be carried out sequentially, whereby lands which are, or will be, most accessible by walking, cycling and public transport – including infill and brownfield sites – are prioritised."*
- *"Planning at the local level should prioritise walking, cycling and public transport by maximising the number of people living within walking and cycling distance of their neighbourhood or district centres, public transport services, and other services at the local level such as schools."*
- *"Support the '10 minute' settlement concept, whereby a range of community facilities and services are accessible in short walking and cycling timeframes from homes or accessible by high quality public transport to these services in larger settlements."*

The RSES, in respect of Housing and Regeneration, states:

RPO 5.4- *Future development of strategic residential development areas within the Dublin Metropolitan area shall provide for higher densities and qualitative standards as set out in the 'Sustainable Residential Development in Urban Areas', 'Sustainable Urban Housing: Design Standards for New Apartments' Guidelines and 'Urban Development and Building Heights Guidelines for Planning Authorities'*.

3.5.1.1 Dublin Metropolitan Area Strategic Plan

The Metropolitan Area Strategic Plan (MASP) provides a 12 to 20-year strategic planning and investment framework for the Dublin Metropolitan Area (DMA), that is aligned with the RSOs of the

RSES. The site of the proposed development at Church Fields East, Mulhuddart, is situated on the Dublin-15 lands which forms the north-west section of the DMA. The vision for the DMA set out in the MASP is as follows:

> *"Over the years to 2031 and with a 2040 horizon, the Dublin metropolitan area will build on our strengths to become a smart, climate resilient and global city region, expanding access to social and economic opportunities and improved housing choice, travel options and quality of life for people who live, work, study in or visit the metropolitan area."* (p. 100)

In order to achieve the compact development targets of the RSES (i.e. at least 50% of all new homes within or contiguous to the existing built up area in Dublin and 30% in other settlements), the MASP identifies strategic residential and employment development corridors, as follows:

- City Centre within the M50 (Multi-modal);
- North-South Corridor (DART Expansion);
- North-West Corridor (Maynooth / Dunboyne Line and DART Expansion);
- South-West Corridor (Kildare Line, DART Expansion and Luas Red Line); and
- Metrolink – Luas Corridor (Metrolink, Luas Green Line Upgrades).

The location of the proposed development does not appear to fall within any of the above-listed strategic development corridors, falling somewhere between the North-West Corridor and the Metrolink-LUAS Corridor. There is no explicit reference to the development lands in the RSES. However, the proposed development will contribute to the achievement of the population growth targets in the RSES, by providing a high-quality new residential development on lands zoned for this purposes by the Local Authority (Fingal County Council).

In built up areas, a general intention to minimise private car use in favour of public transport and walking or cycling, is expressed. It is stated that new developments should *"give competitive advantage"* to these modes, for example by providing for filtered permeability and appropriately designed bicycle parking (p. 187). For urban-generated development; developments within or contiguous to existing urban areas (including on infill and brownfield sites), and developments which are well-served by walking, cycling and public transport, will be prioritised over those which does not meet these criteria.

Owing to its location in a peri-urban area, the proposed development may be expected to entail a high proportion of private car use relative to more central urban residential developments, particularly for the purpose of commutes to-and-from workplaces. However, as discussed above the provision of pedestrian and cycling infrastructure; and availability of public bus services in the area; will promote more sustainable mobility choices, particularly for local journeys. The design of the internal street layout is consistent with the DMURS and *National Cycle Manual*.

It is further stated that:

> *"The design, construction and operation of new buildings has a significant role to play in reducing energy demand and increasing energy efficiency into the future. Careful consideration should also be given to the adaptability of buildings over time, to enable the building stock to be retrofitted or refurbished to meet higher energy efficiency standards into the future."* (p. 180)

It is stated that Sustainable Drainage Systems (SuDS) should be incorporated into public and private developments to minimise the extent of impermeable hard surfacing and reduce the associated

potential for flood risk impacts. As detailed in the Engineering Assessment Report prepared by Waterman Moylan Consulting Engineers Ltd. and submitted under separate cover, the proposed development will feature a variety of SuDS measures, with the objective of controlling the quality and quantity of surface water run-off. For further information, please also refer to Chapter 10 (Hydrology) of this EIAR.

The proposed development is broadly consistent with the *RSES* and the *Dublin MASP*. For further information, please also refer to the Planning Report, prepared by BSM and submitted as part of the planning application under separate cover.

3.5.2 Fingal Development Plan 2023 – 2029

The Fingal Development Plan 2023-2029 sets out an overall strategy for the proper planning and sustainable development of the functional areas of Fingal over a 6-year period. The Development Plan sets out a Strategic Vision for Fingal having regard to the National Strategic Outcomes of the National Planning Framework, the Regional Strategic Outcomes of the Regional Spatial and Economic Strategy, the UN Sustainable Development Goals and the Fingal Corporate Plan 2019–2024. It states that- "… *This Plan will ensure the continued growth of the County in a sustainable way and ensure the County continues to develop as a series of well-serviced, well-connected towns, villages and communities and a low carbon economy*…."

The Plan is underpinned by five key cross cutting themes; climate action, healthy place-making and sustainable development, social inclusion, high-quality design and resilience; and a number of interlinked strategic objectives. Section 1.4 of the Development Plans sets out the 13 No. Strategic Objectives delivering the sustainable approach of the Development Plan. The following strategic objectives are of direct relevance to the future development of the subject lands:

- *Continue the development of a network of well-serviced, well-connected, sustainable neighbourhoods which have a range of facilities, a choice of tenure and universally designed adaptable house types, promote social inclusion and integration of all minority communities.*
- *Ensure new residential development is of the highest quality, endorsing the principles of healthy placemaking, enabling life cycle choices and physical, community, recreation and amenity infrastructure are provided in tandem, to create sustainable, healthy, inclusive and resilient communities.*
- *Ensure the highest quality of public realm and urban design principles are applied to all new developments, ensuring developments contribute to a positive sense of place and local distinctiveness of an area and facilitate the universal design approach into all developments.*

Chapter 2 sets out the Core Strategy for the Plan and the key objective of the Core Strategy is to ensure that the quantum and location of development is consistent with National and Regional policy. The Plan states- *'It is Fingal's priority, and has been for a significant period of time and over successive Development Plans, to form effective and innovative approaches to mobilise development to create housing and quality urban neighbourhoods.' (p.50).* This is further reflected by Policy CSP1- Core Strategy- '*Promote and facilitate housing and population growth in accordance with the overarching Core Strategy to meet the needs of current and future citizens of Fingal*.' The Core Strategy sets out a spatial settlement strategy for the County which is consistent with the Housing Strategy, the National Planning Framework (NPF), the Regional Spatial and Economic Strategy (RSES), Specific Planning Policy Requirements (SPPRs).

The proposed development seeks to provide 217 no. residential dwellings on lands zoned for residential use and is therefore consistent with the Core Strategy for 2023-2029 as set out in the Fingal Development Plan 2023-2029. Further the Plan under housing programme (pg. 25) states- '*The proposed mixed tenure development at Church Fields, Mulhuddart comprises 1,000 social and affordable housing units. The Part 8 planning for the first phase of 300 dwellings and the Eastern Linear Park was approved in 2022.'*

The Regional Planning Guidelines Settlement Hierarchy for the Greater Dublin Area identifies a hierarchy of settlement types within the Metropolitan and Hinterland areas. Under the Development Plan, Blanchardstown (including Castleknock, Clonsilla, Mulhuddart, Ongar, Hollystown, Tyrrelstown and Dunsink) is defined as a ' *Dublin City and Suburbs Consolidation Area'- 'International business core with a highly concentrated and diversified employment base and higher order retail, arts, culture and leisure offer. Acts as national transport hub with strong inter and intra-regional connections and an extensive commuter catchment.'* Blanchardstown is strategically located at the intersection of the N3 and M50 national roads and is the largest settlement centre in Fingal, encompassing the important urban neighbourhoods of Clonsilla, Castleknock, Coolmine, Mulhuddart, Ongar, Tyrrelstown and Hollystown. While Mulhuddart is not specifically identified within the Core Strategy, it is located in the *Dublin City and Suburbs Consolidation Area* associated with Blanchardstown.

Areas of Fingal categorised as Dublin City and Suburbs with respect to the RSES comprise the majority of Fingal's urban footprint. The policies and objectives for the Dublin City and Suburbs highlights the compact, sequential, sustainable growth of the area at appropriately identified locations. In this regard, Policy CSP19- Compact, Sequential and Sustainable Urban Growth states- '*Promote compact, sequential and sustainable urban growth to realise targets of at least 50% of all new homes to be built, within or contiguous to the existing built-up area of Dublin city and suburbs and a target of at least 30% for other metropolitan settlements, with a focus on healthy placemaking and improved quality of life.*'

The proposed development site is zoned 'RS – Residential' which has an overall objective to *"provide for residential development and protect and improve residential amenity*." The RS land zoning objective "*ensures that any new development in existing areas would have a minimal impact on and enhance existing residential amenity*." The subject site is also bound by GDA Cycle Network routes on Damastown Avenue (primary route) and Church Road (secondary route). There is specific objective to '*protect & preserve trees, woodlands and hedgerows'* to the east and south of the proposed development. Refer to **Figure 3.2.**

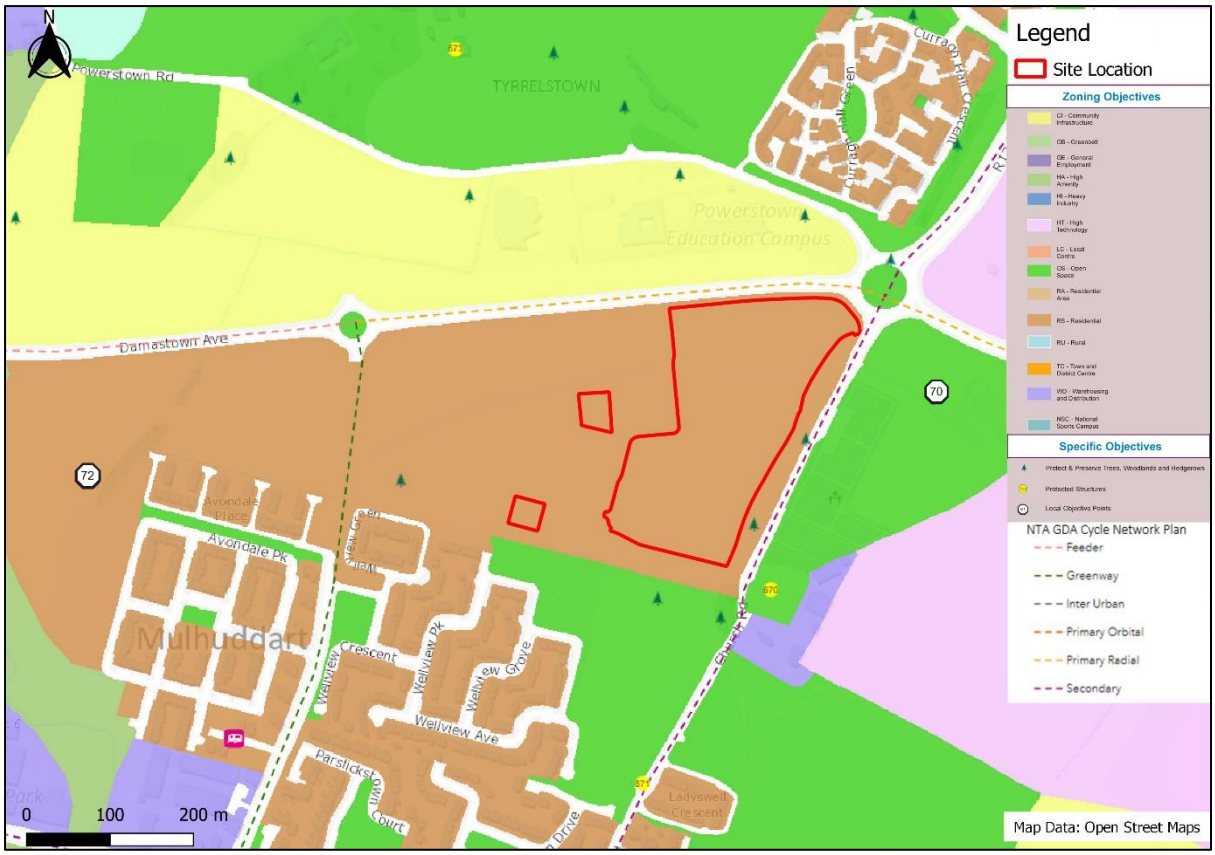
Further, as indicated on Fingal Development Plan 2023-2029 Interactive Map, the site is located outside the Dublin Airport Public Safety Zone (PSZ).

To the south-east of the subject site there is 1 no. Protected Structure and 2 no. National Monuments, refer to **Table 3.2**. Refer to the Chapter 15 'Cultural Heritage, Archaeology & Architectural Heritage' prepared by Courtney Deery for further details.

Table 3.2 Recorded monuments on proposed development site and surrounding area (Source Fingal Development Plan 2023-2029 Interactive Map and NIAH Map Viewer)

Ref Number	Monument Type	Description
RPS No. 670	Protected Structure	Remains of medieval church within walled graveyard that is still in use.
DU013-010001	National Monument	Church
DU013-010003	National Monument	Graveyard

Figure 3.2 Land use zoning at the location of the proposed development (*Fingal Development Plan 2023 – 2029*)



Also, refer to the Planning Report, prepared by BSM and submitted as part of the planning application under separate cover.

3.5.3 Greater Dublin Area Transport Strategy 2022-2042

The Greater Dublin Area Transport Strategy 2022-2028 prepared by the National Transport Authority (NTA) sets out the framework for investment in transport infrastructure and services over next two decades to 2042. The Transport Strategy for the Greater Dublin Area 2022- 2042 replaces the previous framework, titled the Transport Strategy for the Greater Dublin Area 2016-2035.

The overall aim of the Transport Strategy states- "*To provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth*." A key focus of the

strategy is to enable increased use of other transport modes to meet environmental, economic and social objectives related to emissions, congestion and car dependency.

The strategy also provides the following strategy objectives:

- An enhanced natural and built environment;
- Connected communities and better quality of life;
- A strong sustainable economy;
- An inclusive transport system.

The Transport Strategy also includes the following measures for planning for sustainable modes:

- Consolidation of development, to ensure more people live close to services and public transport, and to minimise urban sprawl and long distance commuting;
- Transit-oriented development to guide the growth of our cities and towns on the basis of accessibility;
- Mixed use development, to minimise travel distances between homes and local services, and to ensure vibrancy of urban areas;
- Filtered Permeability so that people can move about more easily by walking and cycling than by car;
- Development of schools to support sustainable transport use for the majority of trips, through appropriate location selection, site design and transport network development; and
- The prioritisation of walking, cycling and public transport in urban street networks, in tandem with high quality public urban spaces, through the Area Based Transport Assessment (ABTA) process.

Major projects provided for in the strategy for 2022-2030 included:

- BusConnects New Dublin Area Bus Network
- BusConnects Core Bus Corridors
- Next Generation Ticketing
- DART+
- Luas Green Line Upgrade
- City Centre Management Measures
- Commence Park & Ride
- GDA Cycle Network
- Climate Action Management Measures

As per Section 8.4, the Strategy states that- "*Facilitating the delivery of large numbers of new housing units of high quality and diversity, in locations which maximise the number and the range of households who can travel by public transport, walking and cycling, is a critical aspect of integrated transport and land use planning in the GDA.*"

The proposed development is broadly consistent with the principles of the Transport Strategy, in that it will deliver residential development at a location proximate to the Dublin Bus Service (40D, 38, 38A, 38B, 220, 220A, 236, 236A, 238). The proposed development is fully permeable for pedestrians and cyclists, and contains cycle infrastructure that will promote and facilitate cycling as an alternative to private car use.

Further, the proposed development will benefit from the BusConnects Dublin, which will deliver high levels of bus priority on all the main corridors and a significantly improved service network. The proposed development is proposed to be serviced by 'B Spine- B3' and 'L62/L63 Local Route' as follow:

- B3: This route, as part of the B-Spine, provides a connection from Tyrrelstown Town Centre to Dún Laoghaire via Dublin City Centre. This service will travel along Church Road (R121) and have a frequency of 15 minutes on weekdays and 15-20 minutes on weekends;
- L62: This local route will operate from Blanchardstown to Broombridge via Tyrrelstown. The all-day service has a frequency of 30 minutes (every 15 minutes during peak times) and largely replicates Dublin Bus's existing route 40e.
- L63: This local route will operate from Damastown to Blanchardstown. The all-day service has a frequency of 15 minutes. This service will travel along Ladyswell Road.
- P63: This peak-only route will operate from Damastown to Corduff to City Centre and largely replicates Dublin Bus's existing route 38b. This service will travel along Ladyswell Road.

Refer to the Planning Report, prepared by BSM and Traffic and Transport Assessment, prepared by Waterman Moylan and submitted as part of the planning application under separate cover.

3.6 Planning History of the Site

This section provides an overview of planning applications at the site of the proposed development and in the immediate vicinity. For further details, and for a comprehensive list of relevant permitted and proposed developments in the wider area, refer to Chapter 21 (Cumulative Impacts).

Significant residential applications relevant to the subject application are summarised below:

3.6.1 FCC Reg. Ref. PARTXI/012/21

Fingal County Council (Architects Department) applied for permission at Churchfields, Mulhuddart, Dublin 15 for a Part 8 development comprising 300 no. dwellings, 1 no. creche facility, 1 no. communal facility, 2 no. retail units and an Eastern Linear Park and all associated site development works on a total site of 9.47ha. The development in accordance with Part XI of the Planning and Development Act 2000 (as amended) and Part 8 of the Planning and Development Regulations 2001 (as amended) was granted planning permission on 14th March 2022 and is currently under construction (to the west of the subject site). There is partial overlap with this permitted scheme, as it interfaces with the proposed development.

3.6.2 FCC Reg. Ref. PARTXI/010/19

Fingal County Council applied for permission at Church Fields, Mulhuddart, Dublin 15 for a Part 8 development comprising 70 no. dwellings, a total of 136 no. car parking spaces and all associated site development works. This development in accordance with Part XI of the Planning and Development Act 2000 (as amended) and Part 8 of the Planning and Development Regulations 2001 (as amended) was granted planning permission on 10th February 2020. This development is currently under construction.

3.6.3 FCC Reg. Ref. PARTXI/011/19

Fingal County Council applied for permission for a Part 8 development consisting of a new link road from the existing roundabout on Damastown Avenue connecting to Wellview Avenue, a new combined cycle track and footway along Damastown Avenue and through the future parkland area adjacent to Church Road, and a new cycle route from Damastown Avenue/ Church Road to Powerstown Educate Together National School, located on Powerstown Road. Planning was approved and the road is currently under construction, vehicular access to the site subject of this application will be provided through the above development.

3.6.4 FCC Reg. Ref. PARTXI/006/18

Fingal County Council applied for permission for a Part 8 development consisting of 20 no. 2-storey 2, 3 and 4 no. bedroom houses and a total of 44 no. car parking spaces. The development in accordance with Part XI of the Planning and Development Act 2000 (as amended) and Part 8 of the Planning and Development Regulations 2001 (as amended) was granted planning permission on 08th April 2019 and is currently under construction (to the south of the subject site).

3.6.5 FCC Reg. Ref. PARTXI/001/22

Fingal County Council (Architects Department) applied for permission at Wellview Park, Wellview Green and Wellview Terrace comprising of rejuvenation and upgrade Wellview Park and two existing areas of public realm in Wellview Green and Wellview Terrace.

Works included pedestrian access points, footpath upgrades, paving and associated drainage works and planning permission was granted on 10th October 2022.

4 Consideration of Alternatives

4.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by Namrata Kaile, Environmental Consultant with Brady Shipman Martin (BSM), Planning, Landscape and Environmental Consultants. A technical review was completed by Thomas Burns, Partner at Brady Shipman Martin. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

Consideration of alternatives is an important step in the EIA process, which is necessary to evaluate the likely environmental consequences of a range of development strategies for the delivery of the proposed development. This chapter provides an overview of the alternatives that have been considered for the proposed development.

4.2 Legislation

Article 5(1) of the amended Directive requires the consideration of reasonable alternatives that are relevant to the proposed development, taking into account the effects of the proposed development on the environment. Article 5(1)(d) states that the information contained in the EIAR shall include:

> *"… a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment."*

Further, Annex IV(2) states that the information for the EIAR shall include:

> *''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 project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.''*

Part 1(d) of Schedule 6 of the PDR 2001 transposes this requirement, stating that an EIAR shall include:

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

4.3 Method

In accordance with the EIAR guidelines, different classes of alternatives may be considered at key stages 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 state that:

> *"The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental*

considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required."

The EPA Guidelines indicate that alternatives should be considered under the following headings:

1. 'Do-Nothing' Alternative;
2. Alternative Locations;
3. Alternative Layouts;
4. Alternative Designs;
5. Alternative Processes; and
6. Alternative Mitigation Measures.

4.4 Do-Nothing Alternative

The 'Do-Nothing' alternative considers the likely scenario that would arise, assuming the proposed development were not progressed, i.e. if nothing were done. Note that this chapter discusses the Do-Nothing scenario in terms of development (or lack thereof) in the absence of the proposed development. The likely impacts of a Do-Nothing scenario in relation to the various environmental topics (e.g. architectural heritage, biodiversity, traffic and so on) are discussed in the respective chapters of this EIAR.

The lands are zoned as RS-Residential in the Fingal Development Plan 2023-2029 and were similarly zoned in the previous Fingal Development Plan 2017-2023. A 'do-nothing' alternative for these zoned lands would mean that these residential zoned lands would not be developed in accordance with the objectives of the Development Plan and would be contrary to the Councils objective to promote residential land use at this site. Therefore a 'do-nothing alternative' is not considered further in this assessment.

4.5 Alternative Locations

The proposed development site is zoned as '*RS- Residential'* under the Fingal Development Plan 2023-2029 and the proposed development is consistent with the core strategy of the Development Plan. Taking into account the Local Authority zoning and development objectives, it is concluded that the site is suitable for the proposed development, which has been tailored to deliver site-specific development objectives.

As stated in the EPA guidelines that:

"Some locations have more inherent environmental sensitivities than others. Depending on the type of project and the range of alternatives which the developer can realistically consider, it may be possible to avoid such sites in favour of sites which have fewer constraints and more capacity to sustainably assimilate the project. It can be useful to ensure that a range of options, that may reasonably be available, are included in the evaluation."

[…]

"Clearly in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant 'alternative location'…"

At this location, the proposed development will deliver additional dwellings in a range of residential unit types along with public and private open spaces and links to existing community facilities. The

subject lands will gain benefit from existing transport, social and community infrastructure. It is considered that the site is entirely suitable for the nature of the proposed development and it is not necessary to consider alternative locations or sites.

4.6 Alternative Layouts & Design

The evolution of the design and layout for the proposed development has been an iterative process which involved the entire design team. The design has undergone rigorous appraisal, which has led to a final layout that responds appropriately to the site characteristics, opportunities and constraints. The final layout, presented in the Architectural Drawings and the Architectural Design Statement (which have been submitted under separate cover and should be read in conjunction with this chapter), has evolved since the initial design stage, subsequent to a number of design team meetings.

This section sets out the intermediate design progressions of the proposed development, includes figures showing the proposed layout at each stage of this process, and summarises the main considerations that have influenced the progression of the design.

4.6.1 Alternative 1

An initial high level preliminary development strategy was prepared for the overall Church Fields lands (refer to Figure 4.1). The preliminary development strategy provided for:

- A new Class 1 Open Space Linear Park as an east-west spine connecting and serving established residential communities to the south and new residential communities (Church Fields) to the north. The Linear Park would also serve to connect the existing open spaces at Lady's Well Park and Wellview Park to Pinkeen river valley in the west;
- Higher density residential typology along Damastown Avenue, with lower density residential development more centrally located;
- Community services distributed across the Church Fields lands;
- Open spaces – other than the linear park – generally located around the edges of the development areas;
- The alignment of the main spine road in the eastern development area makes use of part of a now abandoned section of road within the lands.

Figure 4.1 Church Fields Preliminary Development Framework (Walsh Associates)

4.6.2 Alternative 2A

In considering further development options for the Church Fields lands, an alternative to the preliminary development strategy (Alternative 1) was prepared in the form of the Revised Development Strategy in **Figure 4.2.** This was detailed for the whole of the eastern Church Fields lands – as in **Figure 4.3** and form the basis for the permitted Church Fields Housing and Eastern Linear Park Development (PARTXI/012/21) located to the immediate west of the site – refer to **Figure 4.4**.

The revised development strategy provided for:

- Class 1 Open Space Linear Park as an east-west spine connecting and serving established residential communities to the south and new residential communities (Church Fields) to the north. The Linear Park would also serve to connect the existing open spaces at Lady's Well Park and Wellview Park to Pinkeen river valley in the west;
- Location of higher density residential typology as a strong urban edge along the new Wellview Link Road (permitted under PARTXI/010/19) at the centre of the Church Fields lands and as axial landmarks defining the extent of the development area;
- Lower density residential development is centrally located within a grid allowing for legible north-south connection between the established and emerging residential areas and the intervening linear park;
- Community services centrally located at Wellview Link Road;
- Open spaces – other than the linear park – generally centrally located within the new development areas with a series of 'pocket parks' proximate to residential properties;
- Road hierarchy is community friendly in accordance with DMURS.

Figure 4.2 Church Fields Revised Development Framework (Walsh Associates)

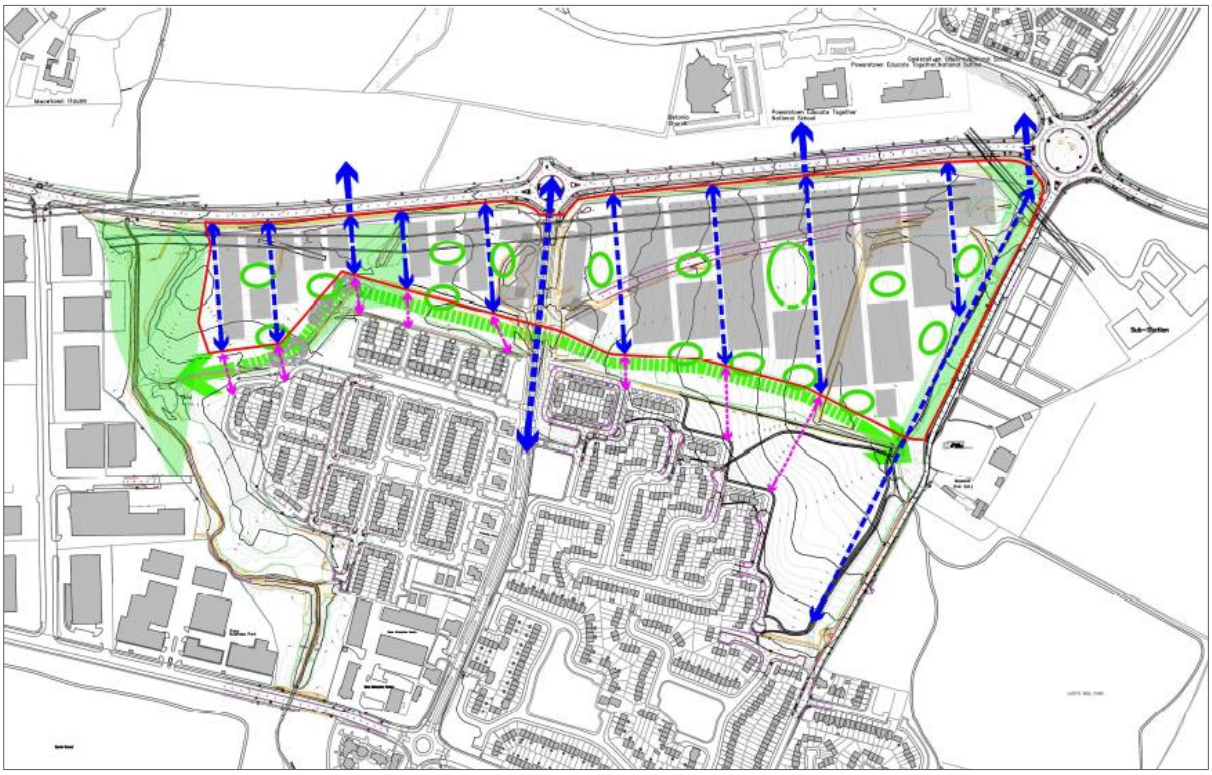


Figure 4.3 Development Strategy for eastern portion of Church Fields lands, including site area (Walsh Associates)

Figure 4.4 Permitted Church Fields Housing and Eastern Linear Park Development (FCC Reg. ref. No.: PARTXI/012/21) (Walsh Associates)

4.6.3 Alternative 2B

In detailing the proposed development for the proposed Church Fields East application, the layout envisaged in Alternative 2A (**Figure 4.3**) has been refined and amended, specifically to meet the requirements of the new Fingal Development Plan 2023-2029 – refer to **Figure 4.5**.

The proposed development provides for:

- Positive engagement and interaction with the Class 1 Public Open Space Eastern Linear Park previously permitted under FCC Reg. ref. No.: PARTXI/012/21;
- Continuation in terms of layout, design and provision of residential typologies as established under the adjoining permitted development (FCC Reg. ref. No.: PARTXI/012/21);
- The use of higher density residential apartment blocks as books-end at the north-east and south-east limits of the proposed residential development;
- Connection to the surrounding infrastructure, including to the footpath and cycleway currently being provided along the eastern boundary of the site (permitted under PARTXI/010/19);
- Provision of locally accessible open spaces – other than the linear park – as pocket parks centrally located within the new development area and as open space to the east extending the tree-lined open space along Church Road.

Figure 4.5 Layout for Proposed Church Fields East Housing Development (Walsh Associates)

4.7 Alternative Processes

Having regard to the nature of the proposed development, this is not considered a relevant class of alternatives in this case.

However, the residential units will be designed to comply with building regulations framework and the requirement to achieve Nearly Zero Energy Building (NZEB) standard.

4.8 Alternative Mitigation Measures

Where appropriate, alternative mitigation measures will be considered by the relevant specialist contributors to the EIAR.

4.9 Assessment of Alternatives

Consideration of reasonable and realistic alternatives takes account of:

- The established zoning of the lands for residential use;
- The peri-urban location of the lands to the north / north-west of Mulhuddart in Dublin 15;
- The established character of existing development in the area is of lower density typical sub-urban residential development located in an intermediate area of improving bus-biased public transport;
- Connectivity and level of service within the area does not support delivery of higher density residential development;

- Minimising likely significant environmental effects.

In this regard it is considered that all of the potential alternatives respond positively to the above considerations. However, Alternatives 2A and 2B provide for a more integrated, connected and legible urban and open space layout building on the provision of the permitted Church Fields Housing and Eastern Linear Park development.

4.9.1 Environmental Effects

Given the appropriate land use zoning, the low environmental sensitivity of the site and its context, and the emerging character of permitted developments, all of the alternatives would have potential for broadly similar positive effects on population through the delivery of required social and affordable residential units and minimal environmental effects on human health, biodiversity, soils, geology, hydrogeology, hydrology, noise and vibration, air quality, climate, cultural heritage, waste and interactions.

Alternatives 2A and 2B are preferable in terms of landscape in the manner in which they allow for a more balanced urban interface with Damastown Avenue, and for provision of open space (Class 2) more centrally and proximate to the residential properties. Provision of such open space on the edge of development, as in Alternative 1, would reduce the functionality and usability of the spaces. Alternative 2B is compliant with the requirements of the Fingal Development Plan 2023-2029, including terms of open space and bike parking, etc.

Therefore, in overall terms the alternatives are neutral in terms of their comparative environmental assessment, however, Alternative 2B is preferable in terms of landscape effects and detail considerations.

5 Description of the Proposed Development

5.1 Introduction

This chapter provides a description of the proposed development in accordance with Article 5(1)(a) of the 2011 EIA Directive, as amended by Directive 2014/52/EU, the description should comprise *"…information on the site, design, size and other relevant features"*. It provides the basis against which the specialist assessments are undertaken. Note that specific details of the proposed development that are of relevance to particular specialist topics are also set out, where relevant, in the corresponding EIAR chapters.

5.2 Site of the Proposed Development

The proposed development site is located in the emerging peri-urban area of Dublin 15, c. 11.5km to the north-west of Dublin city centre and c. 1.5km north of Blanchardstown town centre. The site is situated in the administrative area of Fingal County Council, in the townlands of Tyrrelstown, the local electoral area of 'Blanchardstown Mulhuddart' and the electoral division of 'Blanchardstown-Tyrrelstown'.

The development site is located between a stand of mature tree along Church Road to the east, the permitted Church Fields Housing and Eastern Linear Park Development (PARTXI/012/21) to the west (proposed commencement later in 2023), Damastown Avenue to the north, and a new linear park to the south. The site is located west of protected structure RPS No. 670 Mulhuddart Church (in ruins) and Graveyard, which is located east of Church Road. Further to the south-west of the proposed development site are the existing residential developments of Avondale and Well View where recent housing extension works have been completed. The surrounding area is a relatively new suburban area comprising a mix of uses from residential to commercial. An overhead powerline runs across the north-eastern section of the site.

Further to the north of the Damastown Avenue the lands are in community use comprising of a church and educational facilities (Powerstown Educate Together NS Tyrrelstown and Gaelscoil an Chuilinn). The Tyrrelstown local centre is c. 750m to the north-east of the proposed development. The Lady's Well Park is c. 100m to the south-east of proposed development site. The TU Dublin Blanchardstown Campus is a further c. 720m to the south-east. Further to the north-east is the Amazon Data Centre Technology Park, Pharmaceutical facilities, Blanchardstown Corporate Park, Northwest Logistics and Business Park and, Ballycoolin Business Park, while to the south-west is the Damastown Industrial Park and Plato Business Park comprising light industrial and pharmaceutical activities.

Refer to **Figure 1.1** and **Figure 1.2** in Chapter 1 (Introduction).

5.3 Need for the Proposed Development

The need for the proposed development is set out under national, regional and local policy documents, as detailed in Chapter 3 (Planning & Development Context), above. In summary:

- The Government's *National Planning Framework* (NPF) (2018) predicts that there will be a need for at least half a million additional homes in Ireland by 2040, in order to meet the needs of our growing population. In order to promote sustainable development, the NPF sets out a policy of compact

growth, targeting 40% of new housing development within and close to the existing footprint of built-up areas;

- More recently (2021), the Government's housing plan, *Housing for All*, targets increased supply of new coupled with greater provision of affordable and social housing (an average of at least 33,000 per year to 2030, an average of 6,000 affordable homes and provision of more than 10,000 social homes each year with an average 9,500 new-build Social Housing Homes to 2026);

- The *Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019 – 2031* (RSES) targets the delivery of at least 50% of all new homes within or contiguous to the built up area of Dublin City and suburbs, with at least an additional 30% being delivered in other urban areas in the Region – which takes in Counties Longford, Westmeath, Offaly, Laois, Louth, Meath, Kildare, Wicklow and Dublin. The proposed development will contribute to the achievement of the population growth targets in the RSES, by providing a high-quality new residential development on lands zoned for this purposes by the Local Authority (Fingal County Council);

- The Affordable Housing Act (2021) states for provision of dwellings for the purpose of sale under affordable dwelling purchase arrangements. The proposed development provides for a total of 217 no. units comprising 96 no. apartments and 121 no. houses in a mixed tenure scheme. Please refer to the Planning Report, prepared by BSM and submitted as part of the planning application under separate cover, for a more detailed discussion of how the proposed development aligns with the Act;

- Under the *Fingal Development Plan 2023 - 2029* Fingal County Council identifies Blanchardstown as a '*Metropolitan Consolidation Town- Strong active urban places within the metropolitan area with strong transport links*.' While Mulhuddart is not specifically identified within the Core Strategy, they are located in the Metropolitan Consolidated Town associated with Blanchardstown;

- The proposed development site is zoned 'RS – Residential' which has an overall objective to *"provide for residential development and protect and improve residential amenity*." The RS land zoning objective "*ensures that any new development in existing areas would have a minimal impact on and enhance existing residential amenity*." The subject site is also bound by GDA Cycle Network routes on Damastown Avenue (primary route) and Church Road (secondary route).

5.4 Characteristics of the Proposed Development

5.4.1 Overview

The proposed development relates to a site of c.5.52 hectares at Church Fields East, Mulhuddart, Dublin 15. The development site is located south of Damastown Avenue; west of Church Road; east of previously permitted residential development at Church Fields (Planning Reg. Ref.: PARTXI/012/21); and north of a permitted linear park (Eastern Linear Park Planning Reg. Ref.: PARTXI/012/21), in the townland of Tyrrelstown, Dublin 15. The proposed development seeks the construction of 217 no. residential units (ranging from 2 – 4 storeys in height) in a mixed tenure development, comprising of 121 no. houses and 96 no. apartments. The development will also include the provision of car parking,

cycle parking, new pedestrian / cycle links, services, drainage and attenuation, and all associated site and infrastructural works.

The overall site layout for the proposed development is shown in **Figure 5.1**, below.

Figure 5.1 Proposed development- site layout (Source: Walsh Associates 2023)

5.4.2 Detailed Development Description

The proposed development comprises the following elements, as detailed in the statutory notices:

The proposed development seeks the construction of 217 no. residential units, consisting of 121 no. houses and 96 no. apartments, ranging from 2 – 4 storeys in height, in a mixed tenure development. The development is set out as follows:

- The construction of:
  - 121 no. two and three storey houses (34 no. 2 beds, 76 no. 3 beds, & 11 no. 4 beds);
  - 3 no. four-storey apartment blocks with balconies on all elevations, green roofs, and external amenity courtyards, providing a total of 96 no. units (36 no. 1 beds, 56 no. 2 beds, & 4 no. 3 beds)
- Landscape works including:
  - provision of Class 2 open space of 7,600 sqm, private communal open space of 725 sqm, playgrounds and kick about areas;
  - new pedestrian and cycle connections to Damastown Avenue to the north; to the new Church Fields footpath cycleway to the east; and to the linear park to the south; and

- a new pedestrian connection to Church Road and to Mulhuddart Cemetery on Church Road

- 306 no. car parking spaces (263 no. residential and 43 no. visitor spaces), including 15 accessible spaces; and 897 no. bicycle parking long term and short term spaces, including 6 no. external bike stores providing 300 bicycle spaces for the apartments, and 16 no. free-standing bike bunkers accommodating 96 no. bicycle spaces for mid-terrace houses;
- A temporary construction access to the site from Damastown Avenue;
- Associated site and infrastructural works include provision for water services, foul and surface water drainage and associated connections to the permitted Church Fields Housing and Eastern Linear Park scheme (as permitted under Plan Reg. Ref.: PARTXI/012/21); and Sustainable Drainage Systems, including permeable paving, green roofs and swales. The proposed development includes for proposed surface water drainage which is amended from that permitted under Church Fields Housing and Eastern Linear Park development.
- The proposed application includes all site enabling and development works, landscaping works, PV panels, bins stores, plant, storage, boundary treatments, ESB substations, lighting, servicing, signage, and all site development works above and below ground.

5.4.3 Water Infrastructure

For a detailed description of the proposed water infrastructure, refer to Engineering Assessment Report prepared by Waterman Moylan and submitted under separate cover as part of the planning application.

5.4.3.1 Surface Water

As stated in the Engineering Assessment Report (Waterman Moylan, 2023 and submitted separately), the existing records show that there is an existing 225mm diameter surface water sewer, used to discharge surface water from the Avondale Park development to a dry ditch via a headwall at a rate of 4.38 l/s, located adjacent the south-western boundary of the Church Fields lands, approximately 800m from the subject site. The dry ditch continues further south-west and ultimately discharges to the Pinkeen River.

The proposed development will ultimately outfall into the Pinkeen River to the far west of the site at an overall allowable outfall rate of 35.01 l/s. Runoff from the proposed development will be restricted to the equivalent of the Qbar runoff rate of 3.70 l/s/ha as agreed with Fingal County Council's drainage department in discussions that took place as part of finalising the overall master plan for the Church Fields lands. Surface water runoff shall be restricted via a hydro-brake, or similar approved device, installed at the outfall manhole of the surface water catchment with excess stormwater attenuated within the development site.

The proposed surface water drainage system for the development has been designed as a sustainable urban drainage system and will use above and below ground attenuation together with a flow control device, grass swales, green roofs, rain garden planters, filter drains, and permeable paving. It is proposed to provide sufficient attenuation capacity to cater for the 1:100-year critical storm events with 20% climate change. Strict separation of surface water and wastewater will be implemented within the development. Drains will be laid out to minimise the risk of inadvertent connection of waste pipes etc. to the surface water system. Excess stormwater shall be attenuated within the 800mm deep detention basin and below ground stone tank system.

Surface water shall be managed in accordance with Fingal County Council specific prerequisites and with the Greater Dublin Strategic Drainage Study (GDSDS) Regional Drainage Policies Volume 2, for New Developments. Surface water public sewers will be in accordance with the recommendations contained in the Technical Guidance Documents, Section H and will be laid strictly in accordance with the requirements of Fingal County Council.

5.4.3.2 Foul Water

As per the Engineering Assessment Report (Waterman Moylan, 2023), it is proposed that the foul water from the proposed development will drain by gravity in a south-western direction and discharge into the existing 900mm foul water trunk sewer located along the western boundary via a single outfall.

Drains generally will consist of PVC pipes and all foul water sewers within the development will be laid to comply with the requirement of the Building Regulations and in accordance with the recommendations contained in the Technical Guidance Documents, Section H. Wastewater sewers which will be taken into charge will be laid strictly in accordance with Uisce Éireann's requirements for taking in charge.

As per the Irish Water Wastewater Code of Practice, the domestic wastewater loads have been calculated based on 2.7 persons per unit with a per capita foul flow of 150 litres per head per day. The total dry weather flow from the development is 1.119 l/s, with a peak flow of 6.716 l/s. A peak foul flow factor of 6 has been used, as per the Irish Water Wastewater Code of Practice. The outfall pipe from the development is a 300mm-diameter pipe laid at a minimum gradient of 1:200 which has sufficient capacity to serve all of the future development on the Church Fields lands, and will outfall into the existing 900mm diameter infrastructure located approximately 800m to the west of the site which ultimately flows to Ringsend Wastewater Treatment Plant (WwTP). Therefore, there is adequate capacity in the public foul sewer available to cater for the proposed development.

5.4.3.3 Water Supply

As stated in the Engineering Assessment Report (Waterman Moylan, 2023), there is an existing water pipeline that traverses the proposed development site, running from south-west side of the site towards the north-east side. However, Uisce Éireann has granted a diversion application for this watermain. The new route for the water pipeline diversion will start from Damastown Avenue on the north side of the site and then run southwards along the new Church Fields link road. The proposed development site will connect into the network of the adjoining Church Fields Housing and Eastern Linear Park Development (permitted under PARTXI/012/21) to the west (under construction).

An estimate of water demand from the public water supply system for the proposed site has been based on the development of 217 units, with an average occupancy of 2.7 persons (in compliance with Irish Water- Code of Practice for Water Infrastructure). The average daily demand from the public supply for the development is estimated at 87.9 m^3/day.

In addition, water conservation measures will be used, to further reduce overall water demand, including low volume flush / dual flush WC's, aerated shower heads, spray taps, draw off tap controls, rainwater reuse – water butts where applicable / raingardens and leak detection measures – through the metering of supply.

5.5 Construction Phase

5.5.1 Construction Sequence

The construction phase of the proposed development will include the following elements:

- Site enabling works;
- Sub-structure and superstructure works;
- Infrastructure works.

Standard best practice site management protocols, including good housekeeping and efficient materials management, will be implemented.

5.5.1.1 Site Enabling Works

It is envisaged that the site enabling works will include (but not necessarily be limited to) the following:

- Securing of site boundary and erecting of fencing or hoarding as required;
- Service terminations and positive identification of any services on the site by the utility providers;
- Provision of temporary power, lighting and water services;
- Set up of site accommodation and welfare facilities;
- Archaeological monitoring in accordance with the recommendations of the Archaeological Assessment;
- Identification of the trees that are required to be removed and the removal of these along with scrub and vegetation, in consultation with the appointed Arborist and the recommendations of the tree survey report;
- Identification of the trees that are required to be protected and the protection of these in consultation with the appointed Arborist and the recommendations of the tree survey report;
- Identification of watercourses in the vicinity of the site and measures to be put in place to minimise contamination of same;
- Measures for working in close proximity to existing overhead powerlines in the north-eastern portion of the subject site; and
- Excavation and reuse of soil / subsoil on site.

5.5.1.2 Sub-structure and Superstructure Works

It is envisaged that the sub-structure and superstructure works will include (but not necessarily be limited to) the following:

- Excavation of foundations;
- Excavate, lay and test underground drainage;
- Coordinate and install all incoming services;
- Construction of floor slabs;
- Construction of superstructures and roofs;
- Fit out of the residential units will use traditional fit out techniques and finishing trades;
- Gardens and public open space areas will be landscaped and planted in accordance with the landscaping proposals for the scheme.

5.5.1.3 Infrastructure Works

The site infrastructure works include the provision of the permanent entrance to the site and the permanent connection of all the utilities and services required for the site, including the foul outfall sewer and haul roads for the site.

All works are to be carried out in accordance with Irish Waters Code of Practice for Water and Wastewater and the contractor is to liaise with Uisce Éireann for the duration of the construction phase.

Engagement with the service and utility providers will be entered into early in the design stage to allow for adequate planning of utility infrastructure. Provision of the permanent infrastructure to the site will be carried out as early as possible in the programmed works to incorporate the temporary site requirements with the permanent requirements.

It is the aspiration of the Fingal County Council to minimise disruption of existing services and public roads and pathways in the providing of services to the site, this will be done in consultation with the service providers.

5.5.2 Construction Phasing & Duration

The envisaged duration of the construction phase is 26-28 months.

5.5.3 Construction Materials

The overall materiality for the proposed development will include standard construction material for any residential scheme (concrete, timber, stone etc).

5.5.4 Earthworks

The site of the proposed development is predominantly greenfield in nature. In order to facilitate the construction of the proposed development, soil stripping, earthworks and the storage and handling of excavated material will be required.

In order to minimise the volume of material being exported off-site, excavated material will be reused on-site (e.g. as fill material) where feasible. However, it is envisaged that a certain volume of excavated subsoil will be unsuitable for on-site re-use and will need to be disposed of at an appropriately licenced landfill facility. Indicative earthworks figures are as follows:

- Volume of earthworks – excavated soil / subsoil: 9,550m^3;
- Volume of earthworks – infill: 6,000m^3;
- Volume of earthworks – reuse: 7,640m^3;
- Excess for off-site disposal: 2,050m^3;
- Maximum depth of excavation: 3m.

5.5.5 Hazardous Substances

During the construction phase, hazardous substances typical of construction sites of this nature and scale will be present on-site, including concrete / cementitious materials, oils, fuels, paints and other chemicals. Hydrocarbons, solvents and other such hazardous substances will be stored in secure, bunded hardstanding areas. Re-fuelling and servicing of construction plant and machinery will only be permitted at suitably located, designated hardstanding areas. Spill kits will be present on-site at all times.

5.5.6 Construction Traffic

All traffic for required works will enter the site via a temporary construction access off Damastown Avenue. Refer to **Figure 5.1** below.

A Construction Traffic Management Plan (CTMP) will be prepared for the works. The principal objective of the CTMP will be to ensure that the impacts of all building activities generated during the construction phase upon the public (offsite), visitors to the subject site (on-site) and internal (on-site) workers environments, are fully considered and proactively managed/programmed thereby ensuring that safety is maintained at all times, disruption is minimised and undertaken within a controlled hazard free/minimised environment. During the general excavation of the foundations there will be additional HGV movements from the site. Monitoring measures will be adopted during the entire programme of construction activities on-site.

The CTMP will reflect the requirements of:

- Chapter 8 of the Department of the Environment *Traffic Signs Manual*, current edition;
- Guidance for the Control and Management of Traffic at Road Works (June 2010) prepared by the Local Government Management Services Board (Department of Transport);
- Any additional requirements detailed in the Design Manual for Roads and Bridges & Design Manual for Urban Roads & Streets (DMURS).

Traffic volumes are not anticipated to be significant and turning movements into the site shall be accommodated without delay. Warning signage will be provided for pedestrians and other road users on all approaches in accordance with Chapter 8 of the Traffic Signs Manual and the Contractor's Traffic Management Plan.

5.5.7 Site Compound

It is envisaged that one construction site compound will be required for the purposes of the proposed development.

The construction compound will be engineered with appropriate services and will be hoarded or fenced off for security purposes. The compound will be used as the primary location for the storage of materials, plant, and equipment, site offices (which may be two to three stories in height), and worker welfare facilities. The construction compound will contain facilities for construction personnel and waste segregation area. Temporary toilets and wash facilities will be provided for construction workers. These facilities may require periodic waste pumping and waste offsite haulage, which will be carried out by an authorised sanitary waste contractor. Car parking will be provided for construction workers.

An access control facility will be provided to restrict compound access to site personnel and authorised visitors only.

Materials to be stored on site will be stored in a safe manner and will minimise the risk of any negative environmental effects and will be managed on a 'just-in-time' basis. All fuel storage areas will be bunded in the compound and will be clearly marked. A dedicated fuel filling point will be set up on site with all plant brought to this point for filling.

Appropriate lighting will be provided as necessary at the construction compound. All lighting will be installed to minimise light spillage from the site and will be temporary, i.e. confined to use during construction only.

The construction strategy for existing permitted developments adjoining proposed development, development phases for proposed development, location of construction compound and construction access is shown in **Figures 5.1** to **5.4**.

Figure 5.2 Construction Strategy for Existing Permitted Developments adjoining Church Fields East

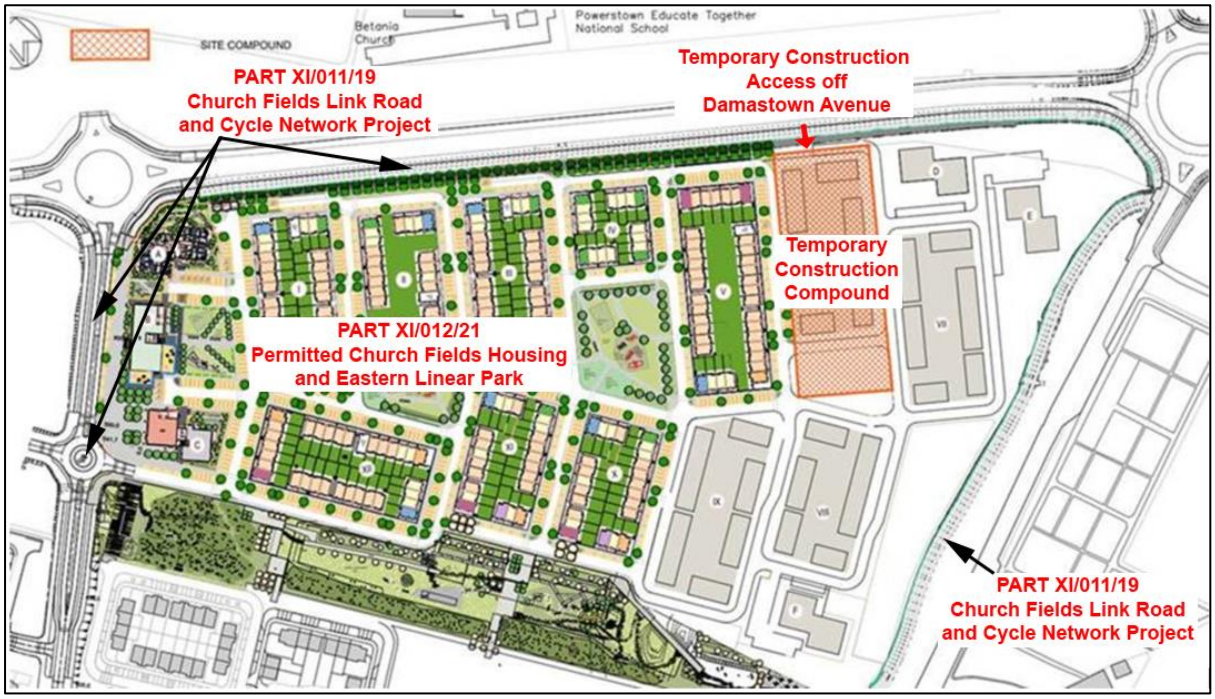


Figure 5.3 Sub-Phase 1A Church Fields East (utilising existing Temporary Site Compound and Access off Damastown Avenue)

Figure 5.4 Sub-Phase 1B Church Fields East (utilising existing Temporary Site Compound and Access off Damastown Avenue)

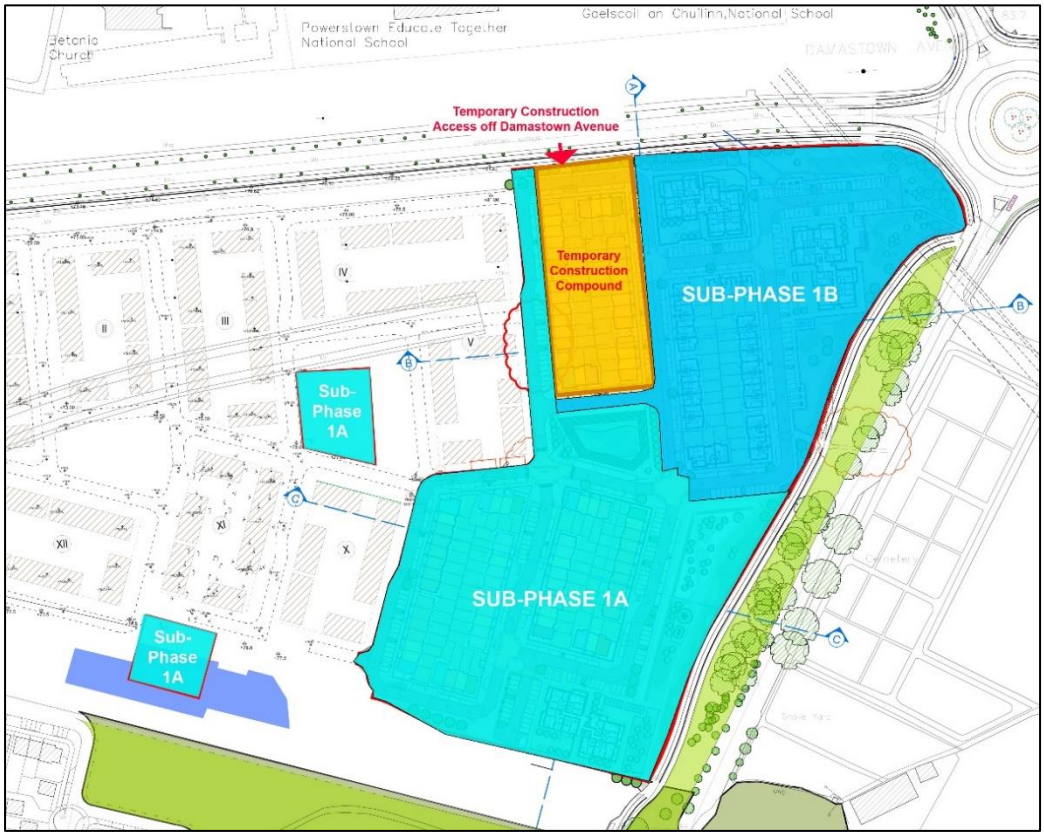
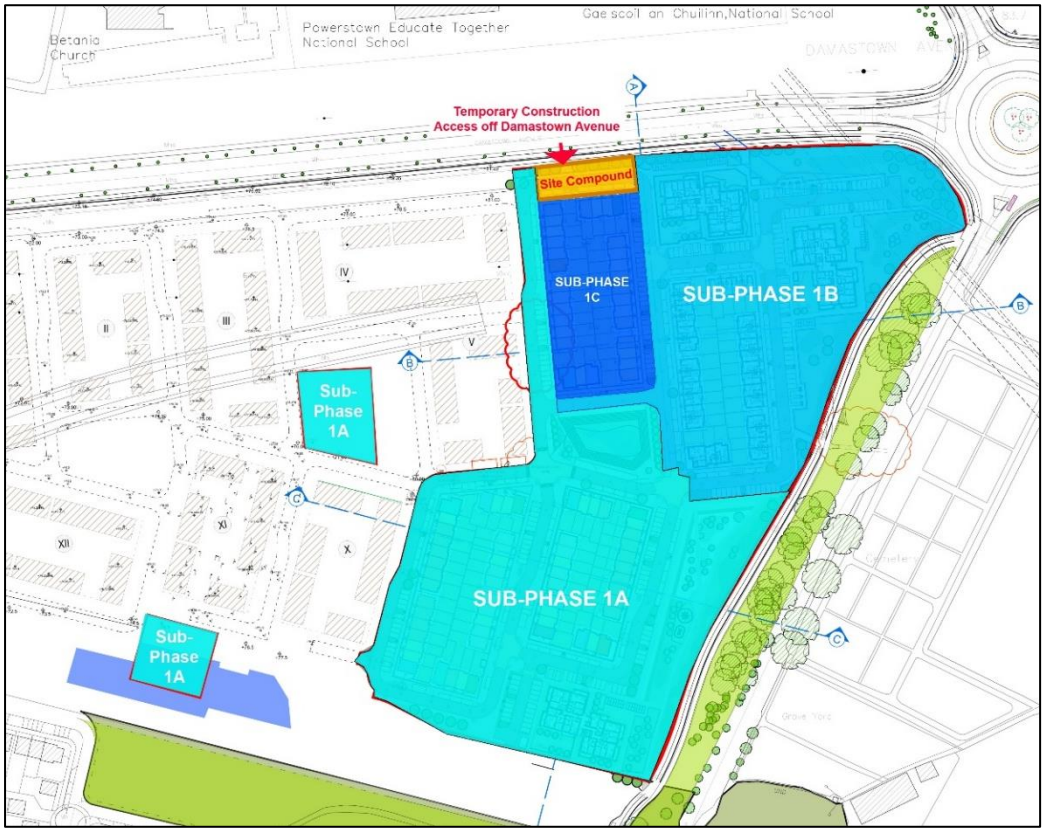


Figure 5.5 Sub-Phase 1C Church Fields East (utilising part of existing Temporary Site Compound and Access off Damastown Avenue)



5.5.8 Working Hours

Envisaged working hours are as follows:

Envisaged working hours are as follows:

- Monday – Friday: 08:00 – 19:00;
- Saturday: 08:00 – 14:00;
- Weekends / Bank Holidays: No works.

Works outside of these hours will be subject to prior agreement with Fingal County Council.

5.5.9 Construction Phase Plans

5.5.9.1 Construction and Environnemental Management Plan

A Construction & Environmental Management Plan (CEMP) has been prepared in respect of the proposed development by Brady Shipman Martin (refer to standalone document submitted under separate cover). It contains best practice measures and protocols to be implemented during the construction phase of the proposed development to avoid / minimise environmental impacts. In the preparation of this Environmental Impact Assessment Report, regard has been had to the mitigation measures and protocols proposed in the CEMP.

The appointed contractor will be responsible for the implementation of the CEMP. The contractor will appoint a suitably qualified Site Environmental Manager (SEM) with responsibility for overseeing the implementation of the CEMP (and all construction phase environmental commitments).

To ensure the CEMP remains fit for purpose, it will be maintained as a live document. The appointed contractor will be responsible for updating the CEMP, as required; e.g. to reflect the publication of relevant new or revised guidelines and / or new statutory requirements. The full schedule of environmental commitments (i.e. all mitigation measures set out in the CEMP and Environmental Impact Assessment Report as part of the planning application, as well as any applicable conditions of development consent) will be included in the CEMP by the appointed contractor.

5.5.9.2 Dust Management Plan

A Dust Management Plan (see Chapter 11) has been prepared by AWN Consulting Ltd. for the construction phase of the proposed development, the implementation of which will provide for the proactive control of fugitive dust. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan.

5.5.9.3 Arboricultural Method Statement

A Tree Survey Report has been prepared in respect of the proposed development by Independent Tree Surveys, and submitted under separate cover as part of the planning application. It contains an Arboricultural Method Statement and general recommendations in relation to tree protection on construction sites. The method statement and recommendations contained in the Tree Survey Report shall be integrated into the final CEMP, and implemented in full during the proposed construction works.

5.5.9.4 Construction Traffic Management Plan

Prior to works commencing on-site, a Construction Traffic Management Plan will be prepared by the appointed contractor in accordance with the following guidance documents:

- Department of Transport, Tourism and Sport (DTTS) (2019). Chapter 8: Temporary Traffic Measures and Signs for Roadworks, in Traffic Signs Manual;
- DTTS (2013). Design Manual for Urban Roads & Streets ('DMURS');
- Department of Transport (2010). Guidance for the Control and Management of Traffic at Road Works (Second Edition);
- NRA (2015). Design Manual for Roads and Bridges ('DMRB').

5.5.9.5 Resource and Waste Management Plan

A Resource & Construction Waste Management Plan (prepared by AWN Consulting Ltd.) will be implemented during the construction phase, and is submitted as part of the planning application. This document shall be finalised by the appointed contractor, in agreement with Fingal County Council, prior to the commencement of the proposed works. For further information, refer to Chapter 17 (Material Assets – Waste).

5.6 Operational Phase

5.6.1 Operational Phase Plans

During the operational phase, it is proposed to implement the following plans of pertinence to the Environmental Impact Assessment Report:

5.6.1.1 Travel Plan

A Travel Plan has been prepared by Waterman Moylan for the operational phase of the proposed development (refer to standalone document submitted under separate cover), to promote sustainable mobility among the residents of the proposed development through a range of measures. The mobility management measures will be deployed to ensure any reduction in car parking standard provision will be catered for and also to ensure as far as is practical sustainable travel to/from the proposed development will be encouraged.

5.6.1.2 Operational Waste Management Plan

An Operational Waste Management Plan (OWMP) has been prepared by AWN Consulting Ltd. (submitted as part of the planning application), containing measures to promote operational phase waste management in accordance with the waste hierarchy, i.e. high rates of reuse, recycling and recovery. The Operator / Facilities Management of the site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP. This is intended to be a live document, to be updated by the Applicant / Operator, where appropriate, e.g. to ensure the Plan remains fit for purpose and up-to-date with relevant policy.

6 Consultation

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by Namrata Kaile, Environmental Consultant with Brady Shipman Martin (BSM), Planning, Landscape and Environmental Consultants. A technical review was completed by Thomas Burns, Partner at Brady Shipman Martin. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

This chapter describes the consultation process of the proposed Project. Consultation is a key element in the EIA process. The 2014 Directive places emphasis on effective public participation in the decision-making procedures for EIA cases.

The structure, presentation of the EIAR, including the Non-Technical Summary (NTS), as well as public access, all facilitate the dissemination of the information contained in the EIAR and the wider application for the proposed development. The core objective is to ensure that the public and local community are aware of the likely environmental effects of projects prior to the granting of consent.

Informal scoping of potential environmental impacts was undertaken with the Fingal County Council through pre-application meetings. Direct and formal public participation in the EIA process will be through the statutory planning application process under the procedures for an application under Section 175 of PDA 2000. Section 175 of the PDA 2000 provides that an application for permission with an EIAR by a local authority shall be made directly to An Bord Pleanála.

6.1 Pre-Application Stage

A series of consultation meetings have been held with the relevant departments of Fingal County Council, including the following departments:

- Planning and Strategic Infrastructure;
- Roads and Transport;
- Environment;
- Housing;
- Heritage;
- Parks and Green Infrastructure;
- Water Services; and
- Architects.

In addition consultation has been undertaken with Uisce Éireann and design acceptance, confirming availability for connection to existing infrastructure, has been received in relation to connection to the water supply and waste water infrastructure

Prior to lodging this application, information in relation to the EIAR was uploaded to the Department of Housing, Planning and Local Government (DHPLG) EIA Portal. The EIA Portal is an online map-based website that provides users with access to applications for development consent with an EIAR.

6.2 Application Stage

The planning application is being submitted directly to An Bord Pleanála, and this stage allows for further consultation, including with prescribed bodies, stakeholders and the general public. The application and all accompanying documents will be available on public display for review and the

Project has a dedicated website on the Fingal County Council website Consultation Portal as set out in the planning notices.

Details of the proposed development have been forwarded to the following prescribed bodies:

- Department of Culture, Heritage and the Gaeltacht (Development Applications Unit);
- Department of Communications, Energy and Natural Resources;
- Department of Housing Planning and Local Government;
- An Chomhairle Ealaíon (the Arts Council);
- Environmental Protection Agency;
- Fáilte Ireland;
- The Heritage Council;
- Inland Fisheries Ireland;
- An Taisce —the National Trust for Ireland;
- Uisce Éireann;
- Health and Safety Authority;
- IAA;
- DAA;
- National Transport Authority (NTA);
- Transport Infrastructure Ireland (TII).

Submissions / observations on any aspect of the proposed Project may be made to An Bord Pleanála within the specific timeframe and such submissions / observations will be taken into account in the determination of the application by the Board.

7 Population & Human Health

7.1 Introduction

This Chapter presents an assessment of the likely impacts of the proposed development on the local population during the construction and operational phases.

The proposed development is described in Chapter 5, and these details are reiterated in this chapter only insofar as is relevant to population and human health.

This chapter has been prepared by Namrata Kaile, Ecologist & Environmental Consultant at Brady Shipman Martin. A technical review was completed by Thomas Burns, Partner at Brady Shipman Martin. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

7.2 Method

The amended Directive updated the list of topics to be addressed in an EIAR and has replaced '*human beings*' with '*population and human health'*. The term '*human health*' is not defined in the amended Directive; however, the European Commission *Guidance on the Preparation of the Environmental Impact Assessment Report* states that:

> *"Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population" (p. 37).*

The EPA guidelines state that:

> *"In an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc.." (p. 28).*

The EPA guidelines advise that the topics of employment, human health, baseline population and amenity should be addressed in this chapter of the EIAR. It is noted that "*The transposing legislation does not require assessment of land-use planning, demographic issues or detailed socio-economic analysis*" *(p. 28).*

There is significant potential for interactions between population and human health and other topics addressed in the EIAR, since impacts on the local population may arise due effects in relation to traffic and transportation, air quality and climate, noise and vibration, landscape and visual amenity, microclimate, material assets, and flood risk, among others. These interactions are addressed in this chapter and, where appropriate, in the relevant other specialist chapters.

The EPA guidelines also state that:

> *"Assessment of other health & safety issues are carried out under other EU Directives, as relevant. These may include reports prepared under the Industrial Emissions, Waste Framework, Landfill, Strategic Environmental Assessment, Seveso III, Floods or Nuclear Safety Directives. In keeping with the requirement of the amended Directive, an EIAR should take account of the results of such assessments without duplicating them." (p. 28).*

This chapter has been prepared with reference to the following guidance documents:

- EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports* ('the EPA guidelines');
- IEMA (2022). *Effective Scoping of Human Health in Environmental Impact Assessment;*
- IEMA (2022). *Determining Significance for Human Health in Environmental Impact Assessment*;
- IEMA (2017). *Health in Environmental Impact Assessment: A Primer for a Proportionate Approach*.

A desk study was carried out to develop a description of the receiving environment (baseline) in relation to population and human health. The following sources were referred to, among others:

- Central Statistics Office (CSO) census data from 2011, 2016 and 2022;
- Fingal County Council (2022). *Fingal Development Plan 2023 – 2029*;
- Department of Housing, Planning & Local Government (DHPLG) (2023). *My Plan Map Viewer*;
- Government of Ireland (2022). *Health in Ireland – Key Trends 2022*;
- AIRO Census Mapping;
- Eastern and Midlands Regional Assembly (2019). *Regional Spatial and Economic Strategy 2019-2031.*

Impacts have been characterised in accordance with the EPA guidelines (refer to Section 1.6 in Chapter 1).

7.3 Baseline Environment

The proposed development site is located in the peri-urban area of Dublin 15, c. 11.5km to the north-west of Dublin city centre and c. 1.5km north of Blanchardstown town centre. The site is situated in the administrative area of Fingal County Council, in the townland of Tyrrelstown, local electoral area of 'Blanchardstown Mulhuddart' and electoral division of 'Blanchardstown-Tyrrelstown'.

The surrounding area is a relatively new suburban area comprising a mix of uses from residential to commercial. The development site is located between a mature tree stand along Church Road to the east, permitted Church Fields Housing and Eastern Linear Park Development (PARTXI/012/21) to the west, Damastown Avenue to the north, a new linear park to the south. Further to the south-west of the proposed development site are existing residential areas of Avondale and Wellview where recent housing extension works have been completed. An overhead powerline runs across the north-eastern section of the site.

Further to the north of the Damastown Avenue the lands are in community use comprising of a church and educational facilities (Powerstown Educate Together NS Tyrrelstown and Gaelscoil an Chuilinn). The Tyrrelstown local centre is c. 750m to the north of the proposed development. The Lady's Well Park is c. 100m to the south-east of proposed development site. The TU Dublin Blanchardstown Campus is further c. 720m to the south-east. Further to the north-east is the Amazon Data Centre Technology Park, Pharmaceutical facilities, Blanchardstown Corporate Park, Northwest, Ballycoolin Business Park, to the south-west is the Damastown Industrial Park and Plato Business Park comprising light industrial

and pharmaceutical activities. **Figure 1.1** and **Figure 1.2**, in Chapter 1 (Introduction) illustrate the location of the proposed development site.

Development objectives applicable to the location of the proposed development are discussed in Chapter 3 (Planning & Development Context).

7.3.1 Population

The CSO provides data on population and socio-economic aspects of the population at different levels from the State, county level, Local Electoral Area (LEA), individual Electoral Districts (ED) to Small Areas (SA) within each County. The 2016 Census undertaken by CSO provides detailed results and reports. A new Census was due to take place in April 2021, but this has been deferred until April 2022 due to the ongoing Covid-19 pandemic and associated public health restrictions. CSO have published preliminary results for 'Census of Population 2022' on 23 June 2022 (updated September 2022).

The CSO data illustrates that the population of the Irish State increased between 2011 and 2016 by 3.8%, and further increased by 7.6% between 2016 and 2022, bringing the total population of the Irish State to c. 5.1 million in April 2022 (see **Table 7.1**, below), which is the highest population recorded in a census since 1841.

The rate of growth has increased from 3.8 % to 7.6% as compared to the previous census, with the largest inward migration to Dublin. The economy has recovered since the last census with consequent population growth predominantly attributed to natural increase, greater economic activity, increased job opportunities and continued immigration. The preliminary results for 2022 census states that Fingal is one of the highest growing counties with a population increase of 11% between Census 2016 and Census 2022.

Table 7.1 Population change in the State, LEA and ED Level 2011 – 2022 (CSO 2011, 2016 & 2022 Census Data)

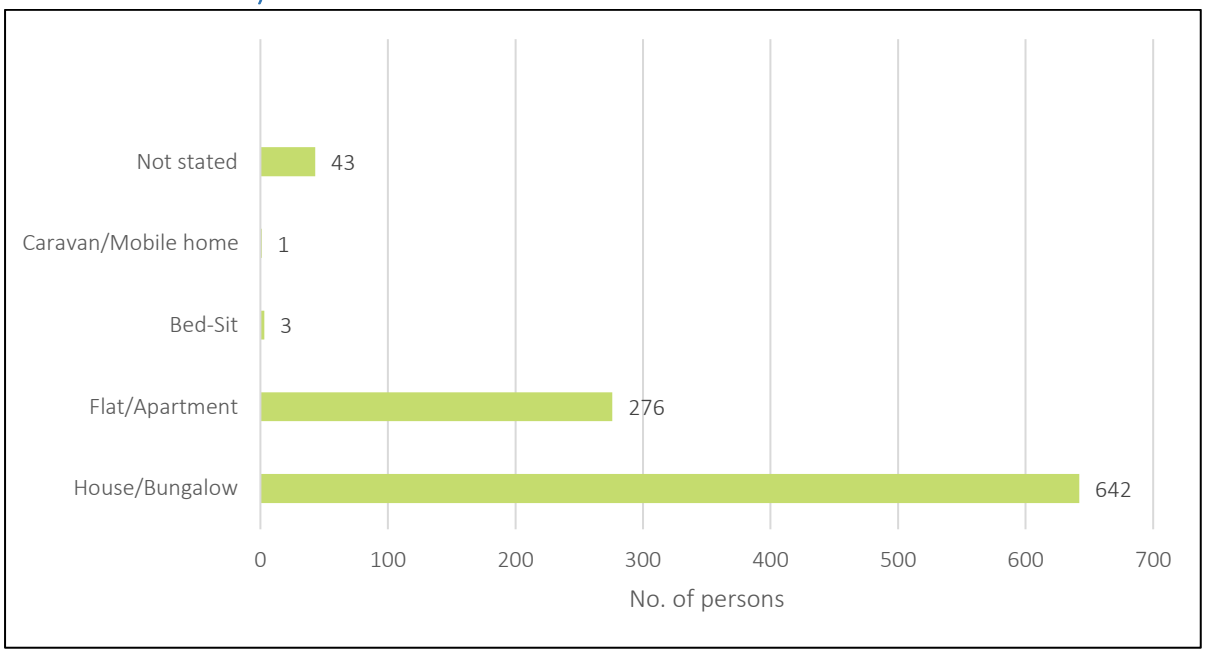
Area	Number of Persons			
	2011	2016	2022	Change
Ireland – State	4,588,252	4,761,865	5,123,536	**+3.8%** (2011-2016) **+7.6%** (2016-2022)
Fingal County Council Administrative Area	273,991	296,020	329,218	**+8.0%** (2011-2016) **+11%** (2016-2022)
Mulhuddart LEA (2014)	55,422	59,747	*Not available yet*	**+7.8%** (2011-2016)
Blanchardstown-Tyrrelstown ED	2,112	3,257	3,321	**+54%** (2011-2016) **+2.0%** (2016-2022)

In the period between 2016 and 2022, the population in the administrative area of Fingal County Council (FCC) increased by 11% as compared to the previous increase of 8% between 2011 and 2016. The site of the proposed development is located in the LEA of 'Blanchardstown Mulhuddart' (as per the 2014 census data, the site is within the Mulhuddart LEA) and the ED of 'Blanchardstown Tyrrelstown'. The 'small area population statistics' is currently unavailable for the Census 2022 and therefore Census 2016 data has been used for the purposes of the assessment. The population statistics indicate that growth at the level of the ED between 2011 and 2016 has been significantly higher that at the level of the LEA and Local Authority administrative area.

7.3.2 Land Use and Settlement Patterns

The proposed development is situated in a peri-urban residential and industrial area of Mulhuddart. The area is at the interface of the suburbs of Dublin City and the rural hinterland to the north / north-west. Residential development in this area is typical of suburban areas, being dominated by medium to large-scale housing estates, predominantly comprised of semi-detached and detached two-storey houses, with relatively few apartments / other accommodation types (**Figure 7.1**). Development in this area is surrounded by industrial and commercial uses along with patches of pre-existing arable and pastoral agricultural land.

Figure 7.1 Private households by accommodation type- Blanchardstown-Tyrrelstown ED, 2016 (CSO, 2017)



The proposed development at Church Fields East is in the administrative area of Fingal County Council and is subject to the Fingal Development Plan 2023-2029 ('the Development Plan'). Under the Development Plan, the proposed development site is primarily zoned RS *'Residential'*, for which the corresponding objective is to *"Provide for residential development and protect and improve residential amenity"*. The surrounding land to the west is also zoned as RS '*Residential'*, to the east and south as OS *'Open Space'* and to the north as CI '*Community Infrastructure'*. The Church Road is to the immediate east of the side and Damastown to the north and there are proposals for cycle network on both the roads under the Greater Dublin Area Cycle Network Plan. To the east of the site, a mature tree stand runs along Church Road and there is specific objective under the Development Plan to '*Protect & Preserve Trees, Woodlands and Hedgerows*'. Refer to **Figure 3.2**, Section 3.5.2, Chapter 3.

There is a concentration of industrial activity in this area, with industrial estates in neighbouring areas at Damastown and Mulhuddart, including a number of SEVESO III sites, as detailed in **Section 2.5.1** (Major Accidents and Disasters).

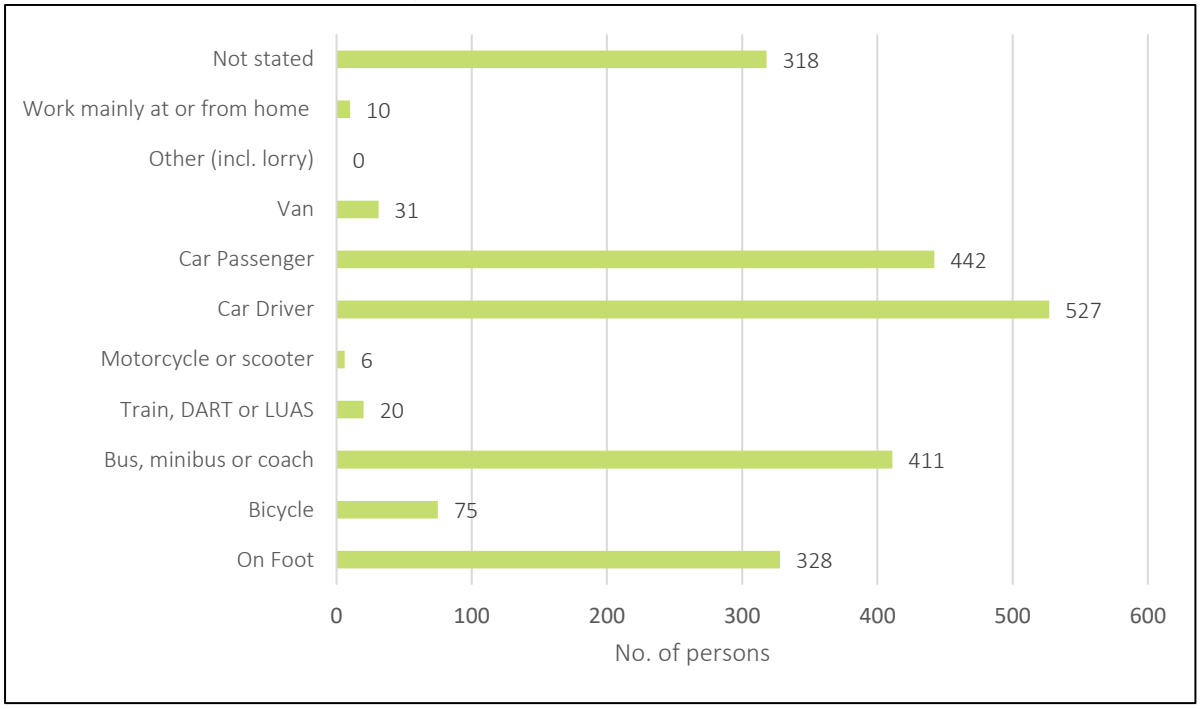
There is a hub of commercial and community amenities (including large grocery stores, medical clinic, pharmacy, restaurants, church, bank and crèche) to the north-east of the proposed development at Tyrrelstown Local Centre. Further, a planning application for retail facilities has been lodged with Fingal County Council (FCC Reg. Ref. F22A/0169) for lands at the Local Centre, adjacent to the existing

Tyrrelstown Local Centre. The proposed development consists of a main retail unit (supermarket), 3 no. retail/ retail service units, a café and a medical centre. (Request for Further Information (RFI) was issued by Fingal County Council on 26th September 2022 and a further Clarification of Further Information was sought on 30 March 2023. This application is currently awaiting a decision from FCC).

Chapter 17 (Traffic & Transportation) details the existing transport infrastructure at the location of the proposed development. To summarise, the location is served by the existing road network, which features pedestrian and cycle infrastructure of the Damastown Avenue. The closest bus stops serving the surrounding area are located on Ladyswell Road and on R121 to the south and east of the subject site, respectively, and both are at a short walk c. 9-10 minutes from the proposed development. The bus stops on Ladyswell Road are served by the Dublin Bus routes 38, 38A and 38B and by the Go-Ahead routes 220, 220A and 238. The bus stops on the R121 are served by the Dublin Bus routes 40D and the Go-Ahead 236, 236A and 238.

The proposed development is fully permeable for pedestrians and cyclists, and contains cycle infrastructure that will promote and facilitate cycling as an alternative to private car use. A search on Google Maps (© 2023) indicates that it would take approximately one hour to get from the location of the proposed development into the city centre and that this might entail changing public transport services / routes along the way in some instances. CSO 2016 Census data indicate a high modal share of private car use in the area, with relatively low rates of walking, cycling and public transport use (**Figure 7.2**).

Figure 7.2 Population aged 5 years and over by means of travel to work, school or college- Blanchardstown-Tyrrelstown ED, 2016 (CSO, 2017)



7.3.3 Economic Activity and Employment

As stated above, the nearest major commercial centres are at Mulhuddart and Blanchardstown. Blanchardstown Corporate Park is c. 610m to the east, Damastown Industrial Park is c. 820m to the west, Ballycoolin Business Park is c. 1.7km to the east, Northwest Business Park is c. 2km to the east, Northwest Logistics Park is c. 2.4km to the north-east. There are centres of employment, as is Dublin

City, c. 11.5 km south-east – a c. 30 minute drive (traffic depending) or approximately one hour by bike or public transport.

As stated previously, there is a concentration of industry in the local area, with a number of industrial estates / business parks; including Ballycoolin, Millennium, Rosemount, Northwest, Premier, Plato, ADSIL, Huntstown and Damastown Technology / Businesss Parks, and Damastown and Blanchardstown Industrial Parks. As stated in the Fingal Development Plan 2023– 2029:

> *"The Dublin Enterprise Zone or DEZ is an area of around 1571 hectares, located in Blanchardstown, Dublin 15 and is home to a variety of industries from R&D, High Tech Manufacturing, Industrial, General Enterprise and Employment. While half of the Dublin Enterprise Zone has been developed, there is the potential to create an additional 20,000 jobs on the 716 hectares of undeveloped, zoned and serviced land available in the Zone."* (p. 263).

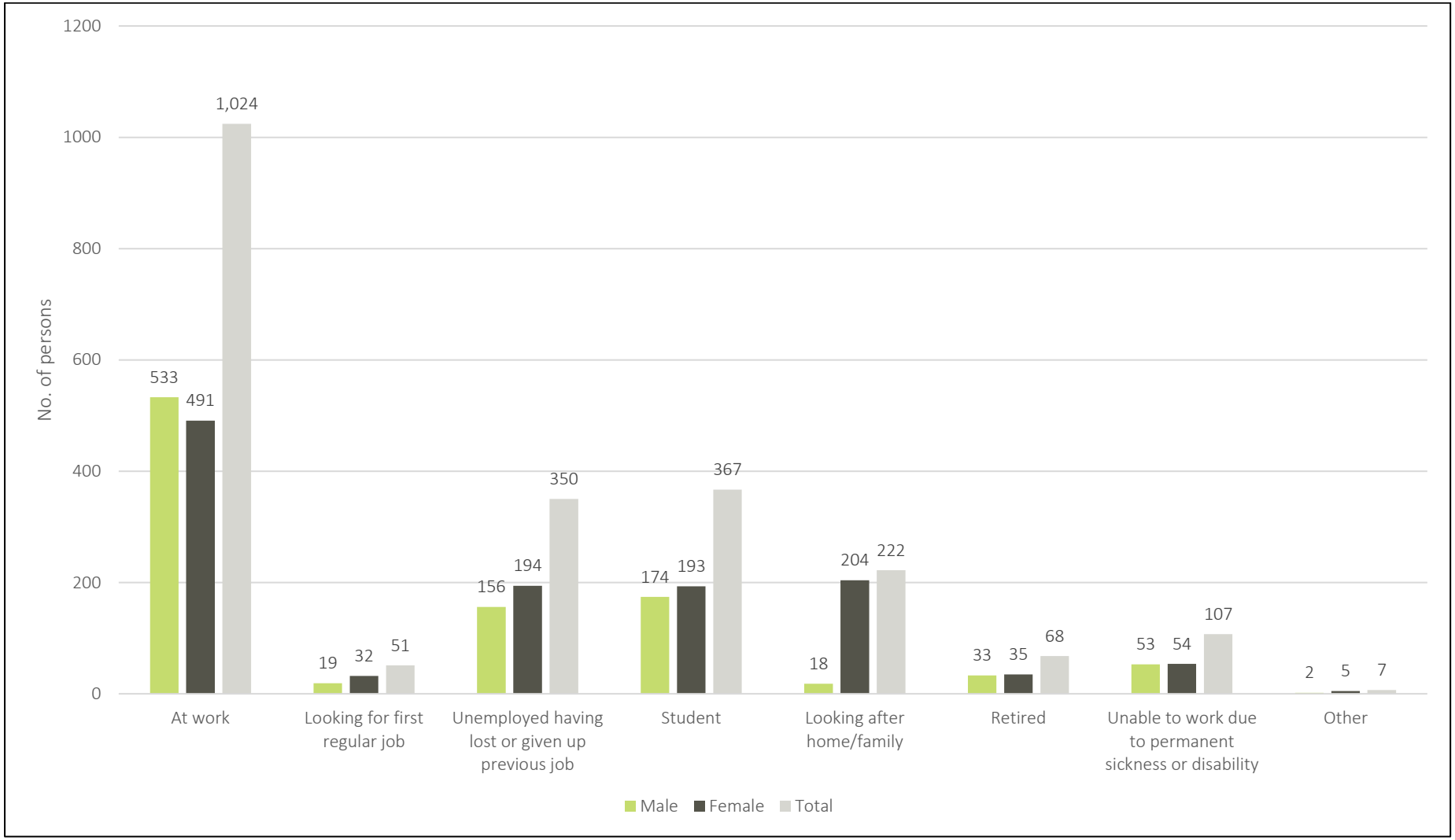
Further it is an objective (Objective EEO8 – Dublin Enterprise Zone) of the Fingal County Council to-

> *"Support the continued investment in, and management and promotion of the Dublin 15 Enterprise Zone in collaboration with key stakeholders, relevant agencies and sectoral representatives."* (p. 267).

It is noted in the Development Plan that- *'The labour force unemployment rate in Fingal in 2016 was 6.9% compared to the national rate of 8.4%. Following an increase in unemployment during the Covid pandemic, the national unemployment rate has reduced to 4.3% (as of February 2023), with Fingal likely to have mirrored this trend.'*

The CSO census data for 2016 indicate a rate of employment in the ED that is within a normal range (Figure 7.3).

Figure 7.3 Principal economic status- Blanchardstown-Tyrrelstown ED, 2016 (CSO, 2017)



7.3.4 Tourism and Amenity

There is a hotel in the vicinity, the Carlton Hotel Blanchardstown, which is c. 800 m north-east of the site of the proposed development in close vicinity of the Tyrrelstown Local Centre. But, generally speaking, the location of the proposed development is not an important area in terms of tourism, with no major attractions in the locality.

7.3.5 Community Infrastructure

For the purposes of the proposed development, BSM has prepared a Social Infrastructure and Childcare Demand Report. These have been submitted under separate cover as part of the planning application. The Social Infrastructure and Childcare Demand Report has determined that within the 2km catchment area there are 23 no. childcare facilities. Furthermore, there 9 no. primary schools within the 2km catchment area and 9 no. secondary schools within the 5km catchment area.

The Tyrrelstown Park and GAA pitches and Tyrrelstown Cricket Club Ground are c. 1km to the north of the proposed development, Mulhuddart Community Centre is c. 620m to the south-east, Tyrrelstown Community Centre is c. 1.2km to north-east and Tyrrelstown local centre is c. 750m to the north-east. The Table 7.2 below provides an overview of the community infrastructure in the area. Healthcare facilities are addressed in the following section.

Table 7.2 Overview of community facilities in the vicinity of the proposed development site

Type	Name	Distance
Community Centre	Mulhuddart Community Centre	c. 620m to south-east
	Tyrrelstown Community Centre	c. 1.2km to north-east
	Corduff Community Resource Centre	c. 1.5km to south-east
	Huntstown Community Centre	c. 1.5km to south-west
Post office	An Post Mulhuddart	c. 970m to south-west
Bank	Bank of Ireland Blanchardstown	c. 2.8km to south-east
ATM	Allied Irish Bank ATM- The Plaza Tyrrelstown	c. 940 m to north-east
Local Centre	Tyrrelstown Local Centre	c. 750m to north-east
Retail Centre	Blanchardstown Retail Centre	c. 1.5km to south
Library	TU Dublin Blanchardstown	c. 800m to south-east
Credit Union	Community Credit Union	c. 2km to south

7.3.6 Human Health

The Department of Health's 2022 report, *Health in Ireland – Key Trends 2022*, provides summary statistics on health and health care in Ireland over the past ten years. The report highlights the following key trends:

- Ireland has the highest self-perceived health status in the EU, with 82.1% of people rating their health as good or very good;
- The population in Ireland has grown by 10.5% since 2013 and the largest change was seen in the over 65 age group which increased by 35% between 2013 and 2022;

- The mortality rates have declined 16% since 2012. The mortality rates due to cancer, circulatory system diseases, ischaemic heart diseases and respiratory diseases have declined by 15%, 34%, 38% and 32%, respectively;
- Life expectancy has improved in Ireland since the past decade and has increased by almost two years since 2010. The female life expectancy in Ireland has matched the EU average and male life expectancy in Ireland has been above the EU average over the past decade;
- Over the past decade, both cigarette and alcohol consumption has declined. The alcohol consumption has declined at a slower rate than cigarette consumption.

At the national level, population health presents a picture of decreasing mortality rates and high self-perceived health over the past ten years. Ireland has the highest self-perceived health status in the EU, with 82.1% of people rating their health as good or very good. In 2021, 81.7% of males and 81.3% females rated their health as being good or very good. However, health status reflects income inequality, people in higher income brackets tend to report better health than those in lower income brackets.

Ireland has a lower infant mortality rate than the EU average over the last decade. Infant mortality, measured as deaths per 1,000 live births, has also decreased by 14.3% since 2011 and remains below the EU average. In 2021, the number of live births have increased by 4.4% since the previous year. Overall, the number of live births has fallen each year between 2012 and 2020 and increased from 2020 to 2021. The 'Total Fertility Rate' for Ireland is at 1.7 and has decreased in the recent years.

Provisional data for 2021 shows a slight decrease of 2.5% in the overall mortality rate over the previous year. The increase in life expectancy is due to significant reductions in major causes of death such as circulatory system diseases and cancer. In Ireland, the suicide rates have decreased by 32.6% since 2012 and has been down by 15.1% between 2020 and 2021. Both in Ireland and EU, males have a higher suicide rate than females. However, the latest figures show that Ireland's three-year moving average for male suicide deaths have fallen below the EU average. However, it should be noted that improvements in mortality rates and high levels of self-rated health can mask variations between regions, age groups and other population subgroups. Rates of cigarette smoking have decreased since 2001, and alcohol consumption has also decreased over the same period, although not as dramatically.

Human health has the potential to be affected by exposure to toxic substances or pathogens in environmental media, such as air, water and soil. Human health impacts can also arise due to anthropogenic or naturally occurring accidents or disasters; such as landslides, flooding or structural failures. Nuisance and negative psychosocial impacts can also arise as a direct result of environmental factors; e.g. as a result of noise, dust, unsafe environments and / or crime; or indirectly, e.g. as a result of economic hardship. Occupational health and safety risks to construction site personnel are also inherent where demolition and construction works are proposed.

The baseline environments in terms of air, climate, surface water, groundwater / soil and microclimate are detailed in Chapter 11 (Air Quality), Chapter 12 (Climate), Chapter 10 (Hydrology), Chapter 9 (Land, Soils, Geology & Hydrogeology), and Chapter 16 (Microclimate: Daylight and Sunlight) respectively. The risks of accidents and disasters are addressed, where relevant, in the various specialist chapters herein. Flood risk, for instance, is addressed in Chapter 10 (Hydrology); while geohazards are addressed in Chapter 9 (Land, Soils, Geology & Hydrogeology). Potential health risks associated with industrial hazards are addressed below.

Healthcare within the study area is provided by a range of different organisations including public, voluntary and private agencies. The Health Services Executive is the primary agency responsible for delivering health and personal social services in Ireland. In recent years, primary care has been identified as the most effective and cost-efficient way to treat patients. This offsets dependence on the hospital system, allowing most patient care to take place at local, community locations which feature multi-disciplinary teams of healthcare professionals working together.

There are a range of healthcare facilities in the vicinity of the proposed development, including Hickey's Pharmacy Tyrrelstown, Oakland Clinic and Tyrrelstown Medical Centre Centric GP (Primacare), all at the Tyrrelstown Local Centre, c. 750m to the north-east. The nearest public hospital is Connolly Hospital, Blanchardstown, a major teaching hospital, whose services include a 24-hour Emergency Department, acute medical and surgical services, acute psychiatric services, day care, out-patient care; and diagnostic, therapeutic and support services. Table 7.3 lists healthcare facilities in the vicinity of the proposed development site.

Table 7.3 Healthcare facilities in the vicinity of the proposed development site

Type	Name	Distance
Pharmacy	Allcare Pharmacy Mulhuddart	c. 620m to south-east
	Hickey's Pharmacy Tyrrelstown	c. 750m to north-east
	Touchstone Pharmacy Mulhuddart	c. 950m to south-west
	Complete Care Pharmacy Mulhuddart	c. 1km to south
Physiotherapy	Physio rooms Mulhuddart	c. 990m to south-west
Dental Clinic	Oakland Dental Clinic	c. 750m to north-east
	Touchstone Dentistry	c. 960m to south-west
Medical Centre	Tyrrelstown Medical Centre Centric GP (Primacare)	c. 750m to north-east
	Oakland Clinic	c. 750m to north-east
	Riverside Medical Centre	c. 960m to south-west
	Alfa Medics Mulhuddart	c. 1km to south
	Synthes Medicl Ireland	c. 1.7km to south-east
	Corduff Primary Care Centre	c. 1.8km south-east
Hospital	Connolly Hospital, Blanchardstown	c. 2.8km south-east
Optician	Specsaver Opticians and Audiologists	c. 1.5km south
	Vision Express Opticians	c. 1.5km south
	Mairead O'Leary Opticians	c. 1.5km south

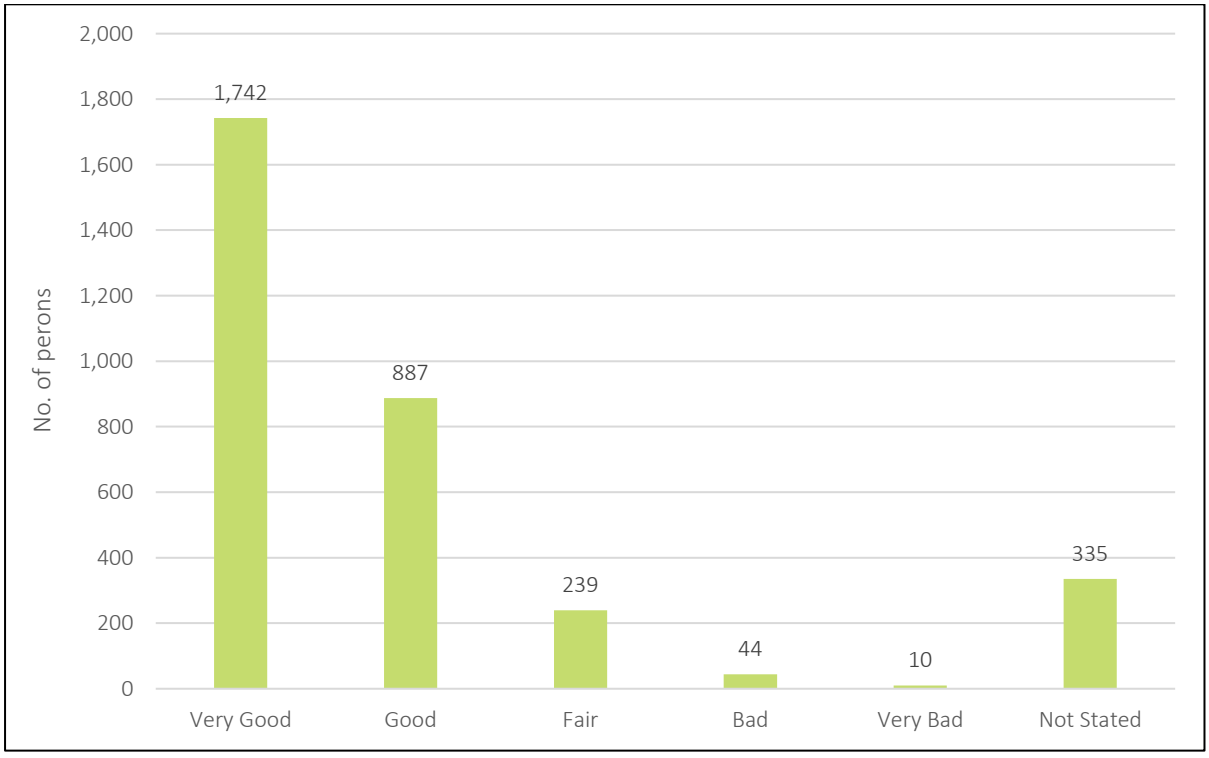
As detailed in Section 2.5.1 (Major Accidents and Disasters), neither the construction nor the operation of the proposed development is likely to contribute to the occurrence of a major accident or disaster at a SEVESO III site (or any other industrial site in the area). Relative to existing residential development

in the area, the proposed development is not especially susceptible to the effects of such an event. The operators of SEVESO III sites have operational protocols in place, such that residents will be informed of potential hazards, in the event of a major accident.

The Dublin Airport is a c. 6.3 km linear distance from the site of the proposed development. Fingal Development Plan 2023 – 2029 sets out the noise zones and policy objectives in relation to aircraft noise from Dublin Airport. Four noise zones are indicated (A – D), representing increasing site exposure to aircraft noise. It is the policy of the Council to actively resist residential development within Zone A, and resist in Zones B and C pending independent acoustic advice and mitigation measures. Chapter 12 of this EIAR (Noise & Vibration) states that the proposed site lies within Airport zone D, the extent of the noise mapping shows that the site falls outside of the extent of the EPA noise map contours. The proposed site lies bounded by mapped roads to the east, north and south. However, the extent of the noise mapping shows that the site is only affected in relation to noise relating to the local road networks on the eastern boundary along Church Road. The levels within the site due to road noise from Church Road are noted to be 55 – 59 dB Lden and 50 – 54 dB Lnight. For further information in this regard, refer to Chapter 13 (Noise & Vibration).

Figure 7.4 presents the self-reported health status of the population in Blanchardstown-Tyrrelstown ED, as reported in the 2016 Census. While the data are self-reported and, therefore, do not provide an entirely accurate picture of the health profile of the area, they do indicate a relatively high level of individual wellbeing in the area.

Figure 7.4 Self-reported general health- Blanchardstown-Tyrrelstown ED, 2016 (CSO, 2017)



7.4 Predicted Impacts of the Proposed Development

7.4.1 Do-Nothing Impact

The 'Do-Nothing' alternative considers the likely scenario that would arise, assuming the proposed development were not progressed, i.e. if nothing were done. In this case, the Do-Nothing scenario might entail:

(a) A continuation of the existing status and use of the lands (predominantly open space); or

(b) Development (likely residential as per the Fingal Development Plan 2023-2029 zoning objectives) under the scope of a separate proposal and application at some point in the future.

Under scenario (a), no significant impacts would arise in relation to population and human health locally. In the context of the ongoing housing crisis in the Dublin Metropolitan Area (DMA), this scenario is considered to represent a socially suboptimal use of the Church Fields East development lands. The opportunity cost, in this scenario, would include the 217no. residential units proposed and the accommodation that these would otherwise provide.

The latter scenario (b) is considered more likely, taking into account the location of the lands, the policy context (including the zoning and development objectives for the lands under the Development Plan) and significant demand for housing in the DMA. The impacts of scenario (b) would depend on the nature of the proposal in question but, given that there are specific development objectives and standards for the site (e.g. under the scope of the Development Plan), would likely be similar to those of the proposed development, as described below.

7.4.2 Construction Phase

The duration of the construction phase is anticipated to be in the range of c. 26-28 months. As such, associated effects are expected to be short-term in duration, at worst. During this time, there will be no community severance or loss of rights of way as a result of the proposed development.

As part of this assessment, the other specialist chapters of the Environmental Impact Assessment Report have been reviewed to identify potential interactions. In the absence of standard good construction practice and mitigation measures, the following potential impacts have been identified during the construction phase:

- Nuisance / health impacts related to exposure to dust;
- Nuisance / disturbance related to elevated noise levels;
- Impacts on traffic / parking due to presence of construction traffic;
- Potential negative impacts on landscape and visual amenity due to presence of construction site and effects of construction activities (e.g. dust, dirt, stockpiling of soils, removal of vegetation, etc.);
- Health impacts related to improper waste management;
- Health impacts related to improper safety protocols, e.g. related to diversions of gas / power lines;
- Nuisance / impacts on residential amenity due to potential service / power outages;
- Impacts due to changes to daylight and sunlight availability on the receiving environment;
- Economic impacts related to construction employment / increased demand for goods and services.

These are considered in the following sections.

7.4.2.1 Dust

Dust-generating activities during the proposed works may create nuisance and human health impacts for local residents, workers and passers-by in the immediate vicinity of the site.

The German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m^2*day) averaged over a one month period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Health & Local Government (DoEHLG, 2004) apply the Bergerhoff limit value of 350 mg/(m^2*day) to the site boundary of quarries.

The extent of dust generation is dependent on the type of dust; the nature of construction activities; and meteorological factors, such as rainfall, wind speed and wind direction. As such, the degree and severity of dust generation is expected to fluctuate across the duration of the proposed works. However, dust generation of some degree may be anticipated throughout.

Chapter 11 (Air Quality) has rated the sensitivity of the area to dust soiling and particulate matter (PM_{10} and $PM_{2.5}$) and the sensitivity to human health. Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM_{10} and $PM_{2.5}$ emissions. As per Section 11.3.3, the surrounding area is of low sensitivity to dust related human health impacts. It was determined that there is an overall low risk of dust related human health impacts as a result of the construction phase of the proposed development. Therefore, in the absence of mitigation there is the potential for **imperceptible, negative, short-term impacts** to human health as a result of the proposed development.

Corresponding mitigation measures have been set out in Chapter 11, and are discussed further below.

7.4.2.2 Noise and Vibration

Chapter 13 (Noise & Vibration) has assessed the potential noise and vibration impacts of the proposed development during the construction phase in relation to construction activities, plant and equipment, and construction traffic.

The nearest potential noise sensitive locations (NSLs) to the site are residential dwellings along the western boundary of the proposed development, at the newly permitted development within Church Fields (FCC Planning Ref: PARTXI/012/21). These permitted dwellings if operational and occupied during construction will be 20m from construction works along the western and south-western boundary of the proposed development. Other NSL's close to the construction works are the Powerstown educate together and the Gaelscoil and Chuilinn National school to the north of the proposed development, these educational spaces are 70m from potential construction works. Residential properties to the south and south-west of the proposed development will be 150m from the construction works. Mulhuddart Cemetery to the east of the proposed whilst not strictly within the scope of noise assessment method (due to its non-residential nature) is 25m to the east of the proposed development, it is advised that care is taken so as construction noise does not disturb the sensitive nature of the cemetery. **Figure 13.9** in Chapter 13 illustrates the closest noise sensitive locations to the development site and illustrates the approximate boundary of the site.

For the purposes of the noise impact assessment, 'Category A' noise threshold level with threshold value of 65 dB(A) will be applied to the nearest noise sensitive locations. In the absence of mitigation, the construction noise levels at the closest NSLs along the western boundaries will be marginally over

the construction daytime significance thresholds with construction site hoarding in place. This indicates a **negative, moderate to significant** and **short term impact** at the closest noise sensitive locations along this boundary. Construction noise levels at the other closest existing NSLs along the northern, southern, south-western and eastern site boundaries are within the construction daytime significance thresholds with construction site hoarding in place. This indicates a **negative, slight to moderate** and **short-term impact** at the closest noise sensitive locations along these boundaries.

In terms of the potential vibration impact during the construction phase, there are no significant excavations into rock associated with this application hence no significant intrusive ground breaking or excavation work will occur. There are also no piling works forecast for the construction of the proposed development. At the closet sensitive building (20m) vibration magnitudes associated with any of the construction activities on site will be orders of magnitude below those associated with any perceptible vibration to building occupants referred to in **Table 13.4** (Chapter 13) resulting in an **imperceptible to not significant** and **temporary impact**.

All traffic for required works will enter the site via the temporary access off Damastown Avenue. During the construction phase, traffic associated with the proposed development would consist of a mix of Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) travelling to and from the site. As per the noise impact assessment in Chapter 13, the resulting change in noise level due to construction traffic is likely to be **short-term, negative** and **not significant**.

7.4.2.3 Traffic

Additional traffic on the road network as a result of the proposed construction works has the potential to cause or exacerbate congestion, resulting in impacts on journey characteristics (i.e. duration and / or length) for local residents, workers and road users. During the construction phase of the proposed development, some construction traffic movements will be undertaken by heavy goods vehicles, though there will also be vehicle movements associated with the appointed contractors and their staff.

A construction carpark, within the construction compound, will be created at the start of works by the laying of a temporary surface for vehicles. It is intended that all HGV deliveries and workforce trips to/from the site will be made from north via left-in left-out temporary access point off Damastown Avenue.

Chapter 17 (Traffic & Transportation) has assessed the potential impacts of the proposed development in this regard, and concluded that the effect of traffic on the surrounding road network during the construction phase will be **short-term** in nature and **slight negative** in terms of effect. Care will be taken to ensure that the pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period. It is likely that construction will have a **not significant, short-term** effect on pedestrian and cycle infrastructure.

7.4.2.4 Landscape and Visual Impacts

The transformation of the existing site into a substantial construction site for the duration of the proposed works will result in negative impacts in terms of landscape and visual amenity, which will be felt wherever the proposed works are visible, but worst on the site and in the immediate vicinity. Site hoarding, machinery, plant and buildings at various stages of completion (i.e. standard features of construction sites) will be visible in the vicinity of the site. Construction activities themselves will also

generate environmental effects that have the potential to negatively affect landscape and visual amenity, including generation of dust and dirt and removal of vegetation.

Chapter 14 (Landscape & Visual) has assessed the impacts of the proposed development in this regard. It states that potential landscape and visual impacts from the construction phase are associated with:

- Site-based landscape disturbance, earthworks, stockpiling of soils and materials.
- Removal of trees / vegetation.
- General construction activity and traffic.
- Construction of new houses and apartment blocks and associated site development works.
- Inconvenience and / or visual effects from dust, dirt, noise.

Chapter 14 has concluded that, in the absence of mitigation, the worst-case impacts in this regard are predicted to **moderate, negative, short-term**. Corresponding mitigation measures have been set out, and are discussed below.

7.4.2.5 Waste Management

Incorrect management of waste material during the construction phase can result in littering, presence of vermin and / or pollution, with associated potential for negative impacts on human health and residential amenity. Chapter 18 (Material Assets – Waste) assesses the impacts of the proposed development in this regard. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter and pollution issues is the presence of vermin, impacts on local biodiversity and the potential for downstream impacts on proximate watercourses and designated sites in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

At present, there is sufficient capacity for the acceptance of the likely waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

Corresponding mitigation measures have been proposed in Chapter 18, and are discussed in Section 7.5, below.

7.4.2.6 Interruptions to Services

As detailed in Chapter 19, works to existing utilities infrastructure will be required during the construction phase to provide connections to the proposed development. Such works have the

potential to result in interruptions to supply / services in neighbouring areas, e.g. power outages. All works will be carried out in a strictly controlled and coordinated manner, in accordance with the relevant standards and codes of the respective service providers / authorities (i.e. Uisce Éireann, ESB, GNI, Eir, Virgin Media), in order to avoid / minimise interruptions insofar as practicable.

It is likely that this potential impact will have a **negative to neutral, non-significant to imperceptible or slight, brief /temporary to short-term effect**.

7.4.2.7 Daylight and Sunlight

The daylight and sunlight impacts of the construction phase of the proposed development are likely to be, initially, lesser than those of the completed proposed development. It is noted that temporary structures and machinery (e.g. hoarding, scaffolding, cranes, etc.) have the potential to result in changes to sunlight access in buildings, although any additional impacts arising in this regard will be **temporary** and **not significant**.

7.4.2.8 Economic Impacts

It is likely that several hundred construction site personnel will be needed over the course of the proposed works. This job creation will result in a **positive, local to regional, moderate, short-term** socioeconomic impact. The presence of site personnel in the area during the construction phase will create additional demand in the area for services, particularly for food from local shops, restaurants and cafés. There will also be economic benefits for providers of construction materials and other supporting services, e.g. quarries. This is predicted to result in a **positive, local to regional, indirect, slight to significant, short-term** socioeconomic impact.

Significant negative economic impacts are not expected to occur as a result of the proposed works, considering that there are relatively few commercial businesses in areas immediately adjacent to the site, access and egress will be maintained to local businesses throughout, and standard best practice measures (including good housekeeping) will be implemented throughout.

7.4.3 Operational Phase

The duration of the operational phase of the proposed development is assumed to be long-term in duration, as per the definitions in the EPA guidelines.

In the absence of mitigation, potential impacts on population and human health as a result of the operational phase of the proposed development may be summarised as follows:

- Potential nuisance and disturbance due to noise generated by traffic on Church Road, increased traffic, and the cumulative noise impact of the foregoing;
- Potential negative impacts on journey characteristics due to additional operational phase traffic generated by the proposed development;
- Positive impacts on journey characteristics due to enhanced permeability across the site;
- Potential visual impacts due to completion of proposed development, establishing substantial new residential;
- Health impacts related to improper waste management;
- Potential impacts due to daylight and sunlight availability for the proposed development;
- Potential socioeconomic impacts due to demand for goods and services locally;
- Positive socioeconomic impacts due to provision of significant additional housing.

These are discussed and characterised, where relevant, in the following sections

7.4.3.1 Noise and Vibration

During the operational phase, the proposed development will generate noise typical of a development of this nature and scale. 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 new residential element. As described in Chapter 13 (Noise and Vibration), traffic flows along the surrounding road network in terms of Annual Average Daily Traffic (AADT) for the Do Minimum and Do Something scenarios have been reviewed to calculate the change in traffic noise. The resultant change in noise level in relation to operational traffic of the development is likely to result in a subjectively inaudible impact. The resulting impact of operational traffic is likely to be **long term, negative** and **not significant to imperceptible**.

There are no building services plant items required to serve the residential aspect of the development during the operational phase. However in the event of mechanical plant being implemented to serve the residential development the cumulative operational noise level at the nearest noise external sensitive location will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods. The resulting impact of mechanical plant and services is likely to be **long term, negative** and **not significant.**

The operational phase noise impact assessment also included inward noise impact assessment, particularly with regard to EPA mapped Church Road to the east of the site. Noise from the road has the potential to impact the residential developments proposed for the site itself. Particularly the apartment blocks E and F on the eastern side of the proposed development. An Acoustic Design Statement (ADS) has been prepared in accordance with the *Professional Practice Guidance on Planning & Noise* ('ProPG') for new residential development (ANC, IOA & CIEH, 2017). Giving consideration to the noise levels presented in the previous sections the initial site noise risk assessment has concluded that the level of risk along the eastern boundary of the site falls into the low medium noise risk category with the rest of the site falling into the low risk category.

ProPG states the following with respect to low and medium risks:

Low Risk — At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.

Medium Risk — As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.

Based on the ProPG guidance, in practice, good acoustic design (GAD) should deliver the optimum acoustic design for a particular site without adversely affecting residential amenity or the quality of life of occupants or compromising other sustainable design objectives.

Control of noise at source from road traffic is outside of the site boundary and hence is outside of the scope of the proposed development. As part of the project design, the overall majority of residential

buildings within the proposed development are set back from the road boundary. The closest properties to the road will experience highest potential noise levels with reduced noise levels further into the site. The properties along the eastern boundary are orientated such that rows of residential buildings are mostly perpendicular to the road, thus reducing the number of noise sensitive facades closest to the road boundary. The buildings themselves screen the external amenity areas.

The design of all buildings is required to meet with all relevant parts of the Building Regulations. The specific detail of which will be completed at detailed design stage. In terms of the building sound insulation, the glazed elements and any required ventilation paths to achieve compliance with Part F of the Building Regulations will be the weakest elements in the façade. Consideration will therefore be given to the provision of sound insulation performance for glazing and ventilation systems, where required to achieve suitable internal noise levels within the development.

In general, all wall constructions (i.e. block work or concrete) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The sound insulation of the roof will be sufficient, provided the roof and internal linings provide an overall sound insulation performance of at least 10 dB higher than the glazing specification. The sound insulation of the roof construction performance shall be confirmed during the detailed design stage.

The ADS has concluded that "*Considering the constraints of the site, in so far as possible and without limiting the extent of the development area, the principles of GAD have been applied to the proposed development*".

Significant negative human health impacts are not likely to occur as a result of inward noise impacts (e.g. due to noise on Church Road) during the operational phase. Taking into consideration the subjective nature of noise nuisance impacts, the predicted impact of inward noise during the operational phase is **long-term, negative, and not significant**.

7.4.3.2 Traffic

Additional traffic generated by the residents of the proposed development has the potential to create or exacerbate congestion on the local road network, resulting in negative impacts on journey characteristics (i.e. amenity, duration and length) for other road users.

Chapter 17 (Traffic & Transportation) has assessed the potential impacts of the proposed development in this regard, taking account of future trip generation of other committed residential developments in the locality; namely the permitted Avondale Park (Planning Reg. Ref. PARTXI/010/19), permitted Wellview cul-de-sacs (Planning Reg. Ref. PARTXI/006/18), permitted Church Fields Housing and Eastern Linear Park Development (Planning Reg. Ref. PARTXI/012/21) and potential future development to the west of Church Fields Link Road.

Traffic modelling was carried out of the impacts of operational traffic flows on the five key junctions on the surrounding road network, as detailed in Chapter 17. From the analysis results as summarised in Chapter 17, it can be determined that the effects of the proposed development during the operational phase with regards to peak hour traffic will be **momentary** in terms or duration and **slight negative** in terms of magnitude. Outside the peak hours, however, the effects are likely to be **permanent** in terms of duration, but **imperceptible** or **not significant** in terms of magnitude.

7.4.3.3 Landscape and Visual Impacts

During the operational phase, there will be impacts on landscape and visual amenity due to completion of proposed development, which will establish a substantial new residential, with associated residential community.

Chapter 14 (Landscape & Visual) has assessed the impacts of the proposed development in this regard. It states that potential landscape and visual impacts from the operational phase are associated with:

- Design, character and quality of proposed buildings.
- Design, amenity and quality of proposed open spaces.
- Overall quality of finish and management of development.

It has concluded that, in the absence of mitigation measures, the worst-case landscape and visual impact is predicted to be **moderate, neutral, long-term.**

7.4.3.4 Waste Management

Incorrect management of waste material during the operation phase can result in littering, presence of vermin and / or pollution, with associated potential for negative impacts on human health and residential amenity. Chapter 17 (Material Assets – Waste) assesses the impacts of the proposed development in this regard.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant** and **negative**.

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant** and **negative**.

The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

7.4.3.5 Daylight and Sunlight

All residential apartment units have undergone an indoor daylight investigation, which evaluated the lighting in both kitchen/living/dining and bedrooms Based on the daylight / sunlight assessment, it was found that the BRE 209-2022 guidelines for illuminance (lux) were exceeded in 100% of the rooms evaluated. This will result in **not significant** effect in the case of daylight access.

The results of the sunlight assessment, every amenity space on the site received at least two hours of sunlight on March 21. This shows that each amenity space can easily comply with BRE guidelines. This will result in **not significant** effect in the case of sunlight access.

The overall shadowing assessment demonstrates a low impact from the proposed development within the development and on the permitted Part 8 properties. The effects are considered to be **slight**.

7.4.3.6 Economic Impacts

By creating additional demand for goods and services, population growth contributes positively to the local economy and creates critical mass that supports the viability of further community infrastructure. This is expected to result in a **positive, moderate, long-term** socioeconomic impact.

Additionally, the proposed development is expected to increase the local population by the order c. 507 persons[9], creating additional demand for goods and services in the local area, benefitting local businesses and resulting in a **positive, moderate and long-term** socioeconomic impact.

The proposed development will provide a large number 217 no. new, high-quality social and affordable residential units at Churchfields East. In the context of an ongoing housing crisis in Dublin, the predicted impact is **moderate to significant and positive** at the scale of the metropolitan area.

At the same time, a substantial new residential population can place strain on the capacity of existing infrastructure, goods, services and amenities in an area. In this regard, Social Infrastructure and Childcare Demand Report has been prepared and submitted under separate cover as part of the planning application. The assessment concluded that there is sufficient infrastructure in the area to meet the resultant demand for school places and community amenities. **Significant negative impacts are not predicted** in this regard.

7.5 Mitigation Measures

Mitigation measures have been prescribed elsewhere in this EIAR in order to avoid / minimise the predicted impacts detailed above. In order to avoid, where possible, and in other cases minimise, negative impacts on population and human health, it is imperative that all of the mitigation measures set out in this EIAR are properly implemented in full. These mitigation measures (set out elsewhere in this EIAR) are summarised as follows, insofar as they relate to population and human health.

7.5.1 Construction Phase

- A Construction and Environmental Management Plan (CEMP) has been prepared in respect of the proposed development by Brady Shipman Martin (refer to document submitted under separate cover). The CEMP will remain a 'live document' and will be further updated by the Contractor (subject to planning approval) in advance of the proposed works, in agreement with Fingal County Council. The CEMP will be fully implemented throughout the proposed works. It will set out the measures to be implemented during the proposed works to mitigate potential impacts on the environment and local population, e.g. measures in relation to good housekeeping, site hoarding and security, traffic management, pollution control and safety;

- A Community Liaison Officer (CLO) will be appointed by the contractor for the duration of the construction phase. They will be responsible for keeping the local community and businesses informed of the timing and duration of potentially disruptive works, and for receiving and addressing concerns of local residents and businesses in relation to the proposed works;

- Chapter 11 (Air Quality) includes a suite of mitigation measures to minimise air quality (including dust) impacts during the construction phase. Mitigation measures are included in relation to dust

[9] Assuming occupancy rates of 1.5 persons per 1-bed or 2-bed unit, and 3.5 persons per 3-bed or 4-bed unit.

suppression, good housekeeping, and proper storage and handling of materials. Dust Management Plan included in Appendix 11.1, shall be finalised by the appointed contractor in agreement with Fingal County Council, and implemented during the proposed works;

- Chapter 13 (Noise & Vibration) includes a suite of mitigation measures to minimise noise impacts during the construction phase. Mitigation measures are included in relation to selection of quiet plant, noise control at source, screening, hours of work, adherence to noise limits, community liaison, monitoring and vibration control;

- Chapter 14 (Landscape & Visual) includes a number of mitigation measures to minimise the impacts of the proposed works on landscape and visual amenity. Mitigation of landscape and visual impacts during the construction phase is focused on ensuring protection of elements to be retained and providing for a degree of visual screening of particular aspects of the works (e.g. the construction compounds);

- Chapter 17 (Traffic & Transportation) includes a suite of measures in relation to dust and dirt control measures, noise assessment and control measures, routes to be used by vehicles, working hours of the site, details of construction traffic forecasts, times when vehicle movements and deliveries will be made to the site, facilities for loading and unloading, facilities for parking cars and other vehicles. It requires the implementation of a Construction Traffic Management Plan, to be prepared by the appointed contractor during pre-construction phase in agreement with Fingal County Council;

- Chapter 18 (Material Assets- Waste) includes a suite of measures in relation to management of construction waste to minimise the impacts of all site construction activities. A Resource and Waste Management Plan prepared as part of the application shall be implemented throughout the construction phase of the proposed development;

- Chapter 19 (Material Assets- Services) includes a suite of measures in relation to management of water supply, wastewater, surface water, gas, ESB supply and telecommunications during the construction phase.

7.5.2 Operational Phase

- Chapter 13 (Noise & Vibration) includes a suite of mitigation measures to minimise noise impacts during the operational phase. Mitigation measures are included in relation to building services noise. At the detailed design stage, best practice measures relating to building services plant will be taken to ensure there is no significant noise impact on NSLs adjacent to the development;

- Chapter 17 (Traffic & Transportation) includes a suite of measures in relation to encourage residents of the proposed development to reduce the dependence on private car and avail of sustainable forms of transport such as walking, cycling and public transport. A Travel Plan has been prepared for the subject development and accompanies the documentation package under a separate cover;

- Chapter 14 (Landscape & Visual) includes a number of mitigation measures to minimise the impacts of the proposed works on landscape and visual amenity. These include measures in relation to good quality architectural design, provision of open spaces, enhanced and additional tree planting etc;

- Chapter 18 (Material Assets- Waste) includes a suite of measures in relation to management of operational phase waste to minimise the impacts of the operational phase of the proposed development. An Operational Waste Management Plan prepared as part of the application shall be implemented throughout the operational phase of the proposed development.

7.6 Residual Impacts

Assuming the proper and full implementation of the mitigation measures in this Environmental Impact Assessment Report (summarised above in relation to population and human health), there will be **no likely significant effects** related to population and human health.

The implementation of the mitigation measures set out in Chapter 13 (Noise & Vibration) will ensure that noise impacts are minimised. Nevertheless, assuming a worst-case scenario, there is likely to be residual construction noise levels below the lower CNT of 65 dB $L_{Aeq,T}$, there is therefore potential for a **residual, negative, slight to moderate** and **temporary impact** at the NSLs along all boundaries.

Taking into consideration the proposed mitigation measures the predicted residual impact of inward noise during the operational phase is **long-term, negative, and not significant**.

The implementation of the mitigation measures set out in Chapter 17 (Traffic & Transportation) management procedures outlined in the Construction Management Plan (CMP) and the Construction Traffic Management Plan (CTMP) during the construction phase, the residual impact upon the local receiving environment is predicted to be **short-term** in nature and **slight negative** in terms of effect.

7.7 Monitoring

Monitoring and maintenance recommended in Chapters 11 (Air Quality), 13 (Noise & Vibration) 17 (Traffic & Transportation) and 18 (Material Assets - Waste) shall be implemented in full during the construction and / or operational phases of the proposed development, as specified in those respective chapters. Beyond that which has been recommended elsewhere in this EIAR, no additional monitoring is considered necessary in respect of population and human health.

7.8 Interactions

Population and human health is an EIA topic which tends to interact with numerous other environmental topics addressed elsewhere in the EIAR. Where the potential for impacts on population and human health has been identified as a result of such interactions, these have been addressed comprehensively above.

The noteworthy interactions with population and human health and other topics are summarised below. All of these interactions have been addressed above and, where feasible, appropriate mitigation measures have been prescribed in the corresponding specialist chapter.

Air Quality (Chapter 11)

- Potential for nuisance impacts due to dust-generating activities of proposed works.

Noise & Vibration (Chapter 13)

- Potential for nuisance and disturbance due to noisy construction activities, plant and equipment;
- Potential for nuisance and disturbance due to construction traffic noise;
- Potential for nuisance and disturbance due to the traffic on the surrounding roads during operational phase; and
- Potential for nuisance and disturbance due to additional traffic during operational phase.

Landscape & Visual (Chapter 14)

- Negative impacts on landscape and visual amenity due to presence of construction site and effects of construction activities (e.g. dust, dirt, stockpiling of soils, removal of vegetation, etc.);
- Visual impacts due to completion of proposed development, establishing substantial new residential.

Traffic & Transportation (Chapter 17)

- Potential for negative impacts on journey characteristics due to additional (construction) traffic on road network during proposed works;
- Potential for nuisance and disturbance due to construction traffic noise;
- Potential for negative impacts on journey characteristics due to additional traffic on road network during the operational phase; and
- Potential for nuisance and disturbance due to operational traffic noise.

Microclimate- Daylight & Sunlight (Chapter 16)

- Potential impacts due to changes to daylight and sunlight availability on the receiving environment.

Material Assets- Waste (Chapter 18)

- Potential health impacts related to improper waste management.

Material Assets- Services (Chapter 19)

- Potential health impacts related to improper safety protocols, e.g. related to diversions of gas / power lines;
- Nuisance / impacts on residential amenity due to potential service / power outages.

7.9 Cumulative Impacts

The potential for cumulative impacts to arise as a result of the proposed development in combination with other existing / proposed plans and projects, as listed in **Table 21.1** in Chapter 21 (Cumulative Impacts) in respect of the EIA topics and environmental media of relevance to population and human health, has been discussed in the respective EIAR chapters – refer to Chapters 11 (Air Quality), 13 (Noise & Vibration), 14 (Landscape & Visual), 16 (Microclimate- Daylight and Sunlight) and 17 (Traffic & Transportation).

It is considered that the potential impacts of the proposed development on population and human health have been mitigated by the design of the proposed development, and mitigation measures set out herein, such that significant negative cumulative impacts on population and human health are not likely to occur as a result of the proposed development in combination with one or more of the plans / projects set out in Chapter 21 (Cumulative Impacts).

7.10 Difficulties Encountered

No difficulties were encountered in the preparation of this chapter.

7.11 References

- CSO (2012). 2011 Census Data
- CSO (2017). 2016 Census Data.
- CSO (2022). 2022 Preliminary Census Data.
- Department of Housing, Planning & Local Government (2022). *My Plan Map Viewer*.
- EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports.*
- Fingal County Council (2023). *Fingal Development Plan 2023-2029.*
- Government of Ireland (2022). *Health in Ireland- Key Trends 2022*.
- IEMA (2022). *Effective Scoping of Human Health in Environmental Impact Assessment*.
- IEMA (2022). *Determining Significance for Human Health in Environmental Impact Assessment.*
- IEMA (2017). *Health in Environmental Impact Assessment: A Primer for a Proportionate Approach.*

8 Biodiversity

8.1 Introduction

This Chapter of the EIAR comprises an assessment of the likely effects on Biodiversity (Flora & Fauna) of the proposed residential development at Church Fields East, Mulhuddart, Dublin 15.

The proposed development is described in detail in Chapter 5 of this EIAR.

The potential for any impacts on sites designated as European (Natura 2000) sites, under the EU Habitats and Birds Directives was also appraised, and the results of that study are presented in a separate report (Appropriate Assessment (AA) Screening Report) that accompanies this application under separate cover.

This chapter has been prepared by Namrata Kaile, Ecologist & Environmental Consultant and reviewed by Matthew Hague, Associate and Senior Ecologist at Brady Shipman Martin. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

8.2 Method

A comprehensive desk-based assessment was undertaken between March and May 2023, and site visits have been carried out by the author and other specialist ecologists, between August 2020 and May 2023, as detailed in the following sections.

8.2.1 Desk Study

This EIAR chapter has been prepared in accordance with the following publications:

- EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Environmental Impact Assessment of Projects – Guidance on Screening (European Commission, 2017).
- OPR Practice Note PN02: Environmental Impact Assessment Screening (Office of the Planning Regulator (OPR) (2021);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, August 2018);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (Transport Infrastructure Ireland (formerly the National Roads Authority, 2009);
- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine ('the CIEEM Guidelines') published by the Chartered Institute of Ecology and Environmental Management (CIEEM), September 2018, updated in September 2019 (V1.1), further updated in April 2022 (V1.2).

The proposed development complies with the following legislative instruments:

- The Planning and Development Act 2000, as amended (the "Planning Acts");
- The Planning and Development Regulations 2001, as amended (the "Planning Regulations");
- The Wildlife Act 1976 to 2022 and the Wildlife (Amendment) Act 2000;

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the "Habitats Directive");
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the "Birds Directive");
- European Communities (Birds and Natural Habitats) Regulations 2011, as amended;
- Flora (Protection) Order 2022 (SI No. 235 of 2022);
- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment;
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).

The report has regard to the following Policies and Plans:

- Third National Biodiversity Plan 2017 – 2021 (Department of Culture, Heritage and the Gaeltacht, 2017);
- Draft for Public Consultation, Ireland's 4th National Biodiversity Action Plan (Department of Housing, Local Government and Heritage, 2022);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland, 2016);
- Planning for Watercourses in the Urban Environment (Inland Fisheries Ireland, 2020);
- All-Ireland Pollinator Plan 2021-2025 (National Biodiversity Data Centre);
- Fingal Development Plan 2023 – 2029, including the accompanying Appropriate Assessment documentation (Natura Impact Report).

In addition, information collated from the sources listed below was reviewed:

- Data on rare and protected plant and animal species contained in the following databases:
  - The National Parks and Wildlife Service (NPWS) of the Department of Housing, Local Government and Heritage (www.NPWS.ie);
  - The National Biodiversity Data Centre (NDBC) (www.biodiversityireland.ie);
  - Birdwatch Ireland (www.birdwatchireland.ie);
  - Bat Conservation Ireland (www.batconservationireland.org);
- Recent aerial photography and photographs taken at the site;
- Recent and historic ordnance survey mapping (www.geohive.ie, Google Earth);
- Information on protected areas, as well as watercourses, catchments and water quality in the area available from https://gis.epa.ie/EPAMaps/;
- Information on soils, geology and hydrogeology in the area available from www.gsi.ie ;
- Information on the Status of EU Protected Habitats and Species in Ireland (NPWS, August 2019), Article 17 Reports:-
  - The Status of EU Protected Habitats and Species in Ireland – Volume 1 (NPWS, 2019a);
  - The Status of EU Protected Habitats and Species in Ireland – Volume 2 (Habitat Assessments) (NPWS, 2019b);
  - The Status of EU Protected Habitats and Species in Ireland – Volume 3 (Species Assessments) (NPWS, 2019c);

- Information on land-use zoning from the online mapping of the Department of the Environment, Community and Local Government www.myplan.ie/en/index.html.

8.2.2 Field Surveys

A significant amount of research has been undertaken by the author and other qualified and experienced ecologists at the site since 2020.

In order to provide a comprehensive baseline on the local ecological environment, ecological surveys were first undertaken on the site and in the adjoining lands in 2021 and 2022 as part of the planning application for the Church Fields Housing and Eastern Linear Park Development (permitted under FCC Ref.: PARTXI/012/21).

A walkover ecological survey was undertaken at the site of the proposed development by Brady Shipman Martin on 04 May 2023. The surveys undertaken comprised habitat, invasive species, rare and/or protected species, large mammals (including otters), bird survey and day-time bat survey.

An assessment of habitat suitability for species with links to European sites was undertaken, in order to appraise the potential for *ex-situ* effects on European sites.

In addition to the ecological surveys undertaken by the authors, specialist bat ecologist Mr Brian Keeley (a suitably qualified and experienced ecologist) carried out dusk and dawn bat surveys at Church Fields on various dates between August 2020 and September 2022. The bat surveys undertaken are consistent with the level of survey recommended in the NPWS document Bat Mitigation Guidelines for Ireland – Wildlife Manuals No. 134 and No. 25.

There are no bat species listed as Qualifying Interests in any European sites within the Zone of Influence (see Section 8.3.7). However, Article 12 of the Habitats Directive requires Member States to take requisite measures to establish a system of strict protection of animal species listed in Annex IV(a) in their natural range.

In addition to the biodiversity surveys, a tree survey was undertaken during May 2023 by experienced arborist John Morgan (Independent Tree Surveys Ltd.). The arboricultural impact assessment and related documentation (submitted separately as part of the planning application) were prepared in accordance with *BS5837: Trees in relation to design, demolition and construction (2012)*.

Previous ecological surveys were undertaken on the site and in the adjoining lands in 2021 and 2022 as part of the planning application for the Church Fields Housing and Eastern Linear Park Development, permitted under FCC Ref.: PARTXI/012/21, in the immediate vicinity of the proposed development to the west and south.

Overall, the baseline surveys covered the following elements and, where relevant, the results are included in this document:

- Habitats;
- Invasive species;
- Rare and/or protected plants;
- Bat activity surveys and assessment of bat roosts;
- Large mammal surveys (badger, otter);
- Suitability for breeding and wintering birds;
- Amphibian and common lizard surveys.

8.2.2.1 Habitats and Flora

During the course of the site visits, the habitats were identified, described and mapped. Habitats were surveyed using the *Best Practice Guidance for Habitat Survey and Mapping*[10] and were classified using *A Guide to Habitats in Ireland*[11] with due regard to the *Interpretation Manual of European Habitats*[12]. Vascular plant nomenclature follows that of the *New Flora of the British Isles 3rd Edition*[13].

8.2.2.2 Fauna

On each visit, the site was searched for evidence of large mammals, such as badger, both within the site itself as well as in the wider area of the Church Fields site strategy lands. The proposed development site was also searched for evidence of breeding birds during each visit. A comprehensive series of bat surveys was also undertaken and the Bat Survey Report is included in **Appendix 8.1** of this EIAR.

8.2.3 Evaluation of Ecological Features

The methodologies used to determine the value of ecological resources, to characterise impacts of the proposed development, and to assess the significance of impacts and any residual effects are consistent with the *EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022) (the 'EPA Guidelines') and are in accordance with the *NRA Guidelines for Assessment of Ecological Impacts of National Road Schemes* (2009) (the 'NRA Guidelines'). This methodology is in turn consistent with the *CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland – Terrestrial, Freshwater, Coastal and Marine* (Version 1.2) (2018, updated 2022) (the 'CIEEM Guidelines'). The methodology allows the baseline to be comprehensively evaluated. This then makes it possible to assess the potential impacts (including cumulative impacts) of the proposed development, to set out appropriate mitigation measures and to assess the residual impacts of the proposed development.

In accordance with the NRA Guidelines, impact assessment is undertaken of sensitive ecological receptors (Key Ecological Receptors) within the Zone of Influence of the proposed development. According to the NRA Guidelines, the Zone of Influence is the "effect area" over which change resulting from the proposed development is likely to occur and the Key Ecological Receptors are defined as features of sufficient value as to be material in the decision-making process for which potential impacts are likely. In the context of the proposed development at Church Fields East, a Key Ecological Receptor is defined as any feature valued as follows:

- International Importance;
- National Importance;
- County Importance;
- Local Importance (Higher Value).

Features of local importance (Lower Value) and features of no ecological value are not considered to be Key Ecological Receptors.

10 Smith G. F., O'Donoghue P., O'Hora K. and Delaney E. (2010)

11 Fossitt J. (2000)

12 https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf

13 Stace, C. (2010)

8.3 Baseline Environment

8.3.1 General Description

The proposed development relates to a site of c.5.52 hectares at Church Fields East, Mulhuddart, Dublin 15. The site is located between a stand of mature beech trees along Church Road to the east, the permitted Church Fields Housing and Eastern Linear Park Development (PARTXI/012/21) to the west (under construction), Damastown Avenue to the north, and a new linear park (under construction) to the south. The site is situated in the administrative area of Fingal County Council, in the townland of Tyrrelstown, c. 11.5km to the north-west of Dublin city centre and c. 1.5km north of Blanchardstown town centre.

The site is effectively green-field. Most of it is used as amenity space and it is zoned for residential development. No existing structures are present on the site. An earth bank runs north-south through the western part of the site; and a cycle track followed by a treeline runs outside the eastern boundary of the site between the site boundary and Church Road. A treeline and hedgerow associated with the earth bank traverses the site through the northern part. Further north the site is covered by grassland with encroaching scrub and interspersed with spoil and rubble.

8.3.2 Designated Conservation Areas

This assessment uses a source-pathway-receptor model to assess environmental risk. For the risk of an adverse effect to occur there must be a 'source', such as a construction site; a 'receptor', such as a site designated for nature conservation; and a 'pathway' between the source and the receptor, such as a watercourse that links the construction site to the proposed development site. Although there may be a risk of an impact, it may not necessarily occur, and if it does occur, it may not be significant.

The potential for any impacts on European sites from the proposed development site was considered. Full details of that study are presented in a separate report (Appropriate Assessment (AA) Screening Report), submitted as part of this application under separate cover.

No designated conservation areas occur within or in the immediate vicinity of the site of the proposed development. There are a number of designated sites within the Zone of Influence of the proposed development; however, the AA Screening report concludes that, on the basis of objective information, it can be excluded that the construction and operational phases of the proposed development, individually or in-combination with other plans or projects, will have significant effects on any European site.

8.3.2.1 Relevant European Sites

There are no European sites within the immediate vicinity of the proposed development site at Church Fields East, Mulhuddart, Dublin 15.

The site of the proposed development is not under any designation for nature conservation and there are no European sites in the immediate vicinity. The nearest such sites are as follows (as shown in **Figure 8.1**):

- Special Areas of Conservation (SAC):
  - Rye Water Valley/ Carton SAC (site code 001398), c. 8.2 km to the south-west;
  - Malahide Estuary SAC (site code 000205), c. 13.5 km to the north-east;
  - South Dublin Bay SAC (site code 000210), c. 14.5 km to the south-east;

- North Dublin Bay SAC (site code 000206), c. 15 km to the south- east;
- Rogerstown Estuary SAC (site code 000208), c. 16.5 km to the north-east;
- Baldoyle Bay SAC (site code 000199), c. 16.7 km to the east;
- Howth Head SAC (site code 000202), c. 20.2 km to the south-east;
- Rockabill to Dalkey Island SAC (site code 003000), c. 21.2 km to the east;
- Ireland's Eye SAC (site code 002193), c. 21.3 km to the east;
- Lambay Island SAC (site code 000204), c. 25.2 km to the north-east.

- Special Protected Areas (SPA):
  - North Bull Island SPA (site code 004006), c. 12.2 km to the south-east;
  - South Dublin Bay and River Tolka Estuary SPA (site code 004024), c. 14.5 km to the south-east;
  - Malahide Estuary SPA (site code 004025), c. 13.5 km to the north-east;
  - Rogerstown Estuary SPA (site code 004015), c. 16.5 km to the north-east;
  - Baldoyle Bay SPA (site code 004016), c. 16.7 km to the east;
  - Ireland's Eye SPA (site code 004117), c. 21.1 km to the east;
  - Howth Head Coast SPA (site code 004113), c. 23 km to the south-east;
  - Dalkey Islands SPA (site code 004172) , c. 24.6km to the south-east;
  - Lambay Island SPA (site code 004069), c. 25.2 km to the north-east.

The site of the proposed development is not under any designation for nature conservation. There are no European sites in the immediate vicinity. The nearest such site is the Rye Water Valley / Carton SAC, c. 8.2km south-west – to which there is no potential impact pathway.

Full details of these and all other European sites with potential links to the proposed development site are contained in the AA Screening Report, submitted as part of this application under separate cover.

8.3.2.2 Other Designated Conservation Areas

The nearest sites designated for nature conservation, not otherwise designated as European sites, are as follows (see **Figure 8.2**).

These sites (excluding those already designated as European sites) are as follows:

- Royal Canal pNHA (site code 002103), c. 3.5 km south;
- Liffey Valley pNHA (site code 000128), c. 5 km south;
- Santry Demesne pNHA (site code 000178), c. 8.8 km south-east;
- Rye Water Valley/Carton pNHA (site code 001398), c. 8.2km south-west;
- Grand Canal pNHA (site code 002104), c. 9.2 km south;
- Feltrim Hill pNHA (site code 001208), c. 13 km north-east;
- North Dublin Bay pNHA (site code 000206), c. 12.2 km to the south-east;
- South Dublin Bay pNHA (site code 000210), c. 14.5 km to the south-east;
- Dolphins, Dublin Docks pNHA (site code 000201), c. 15.3 km south-east;
- Booterstown Marsh pNHA (site code 001205), c. 16.8km south-east;
- Howth Head pNHA (site code 000202), c. 20.2 km to the south-east;
- Dalkey Coastal Zone and Killiney Hill pNHA (site code 001206), c. 24.6km to the south-east.

There are no fully designated Natural Heritage Areas (NHA) within the potential Zone of Influence of the proposed development.

Note that the above-listed distances are linear (i.e. 'as the crow flies').

Figure 8.1 European sites within zone of influence of the proposed development. A 15km radius is shown for scale

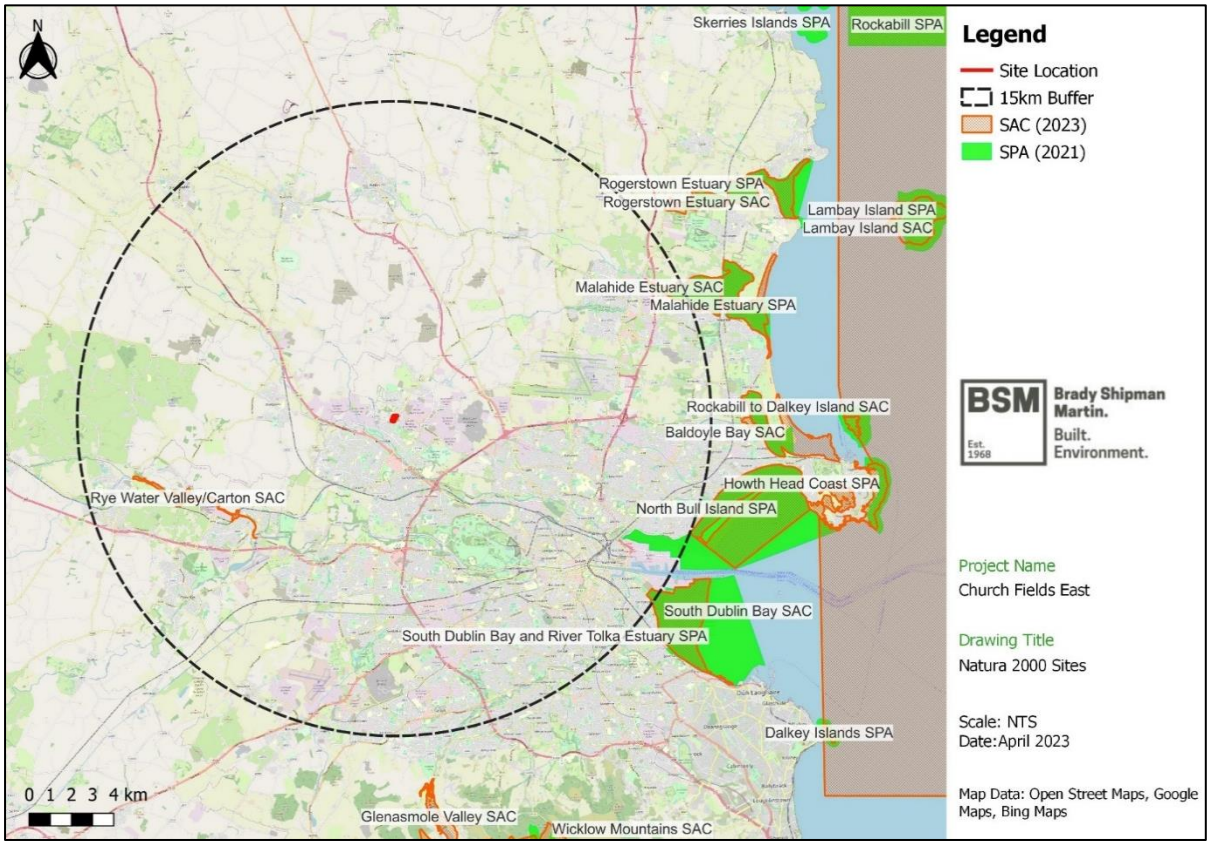
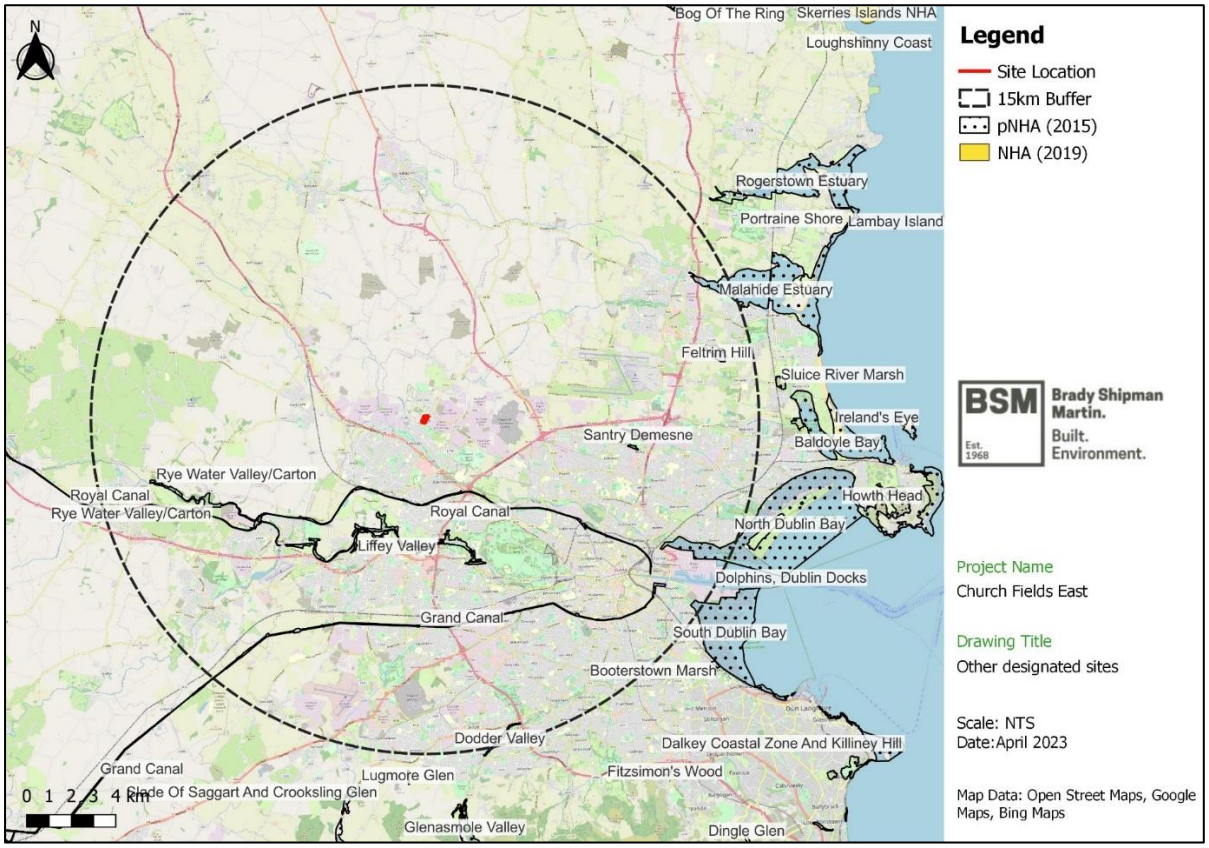


Figure 8.2 pNHA sites within zone of influence of the proposed development. A 15km radius is shown for scale

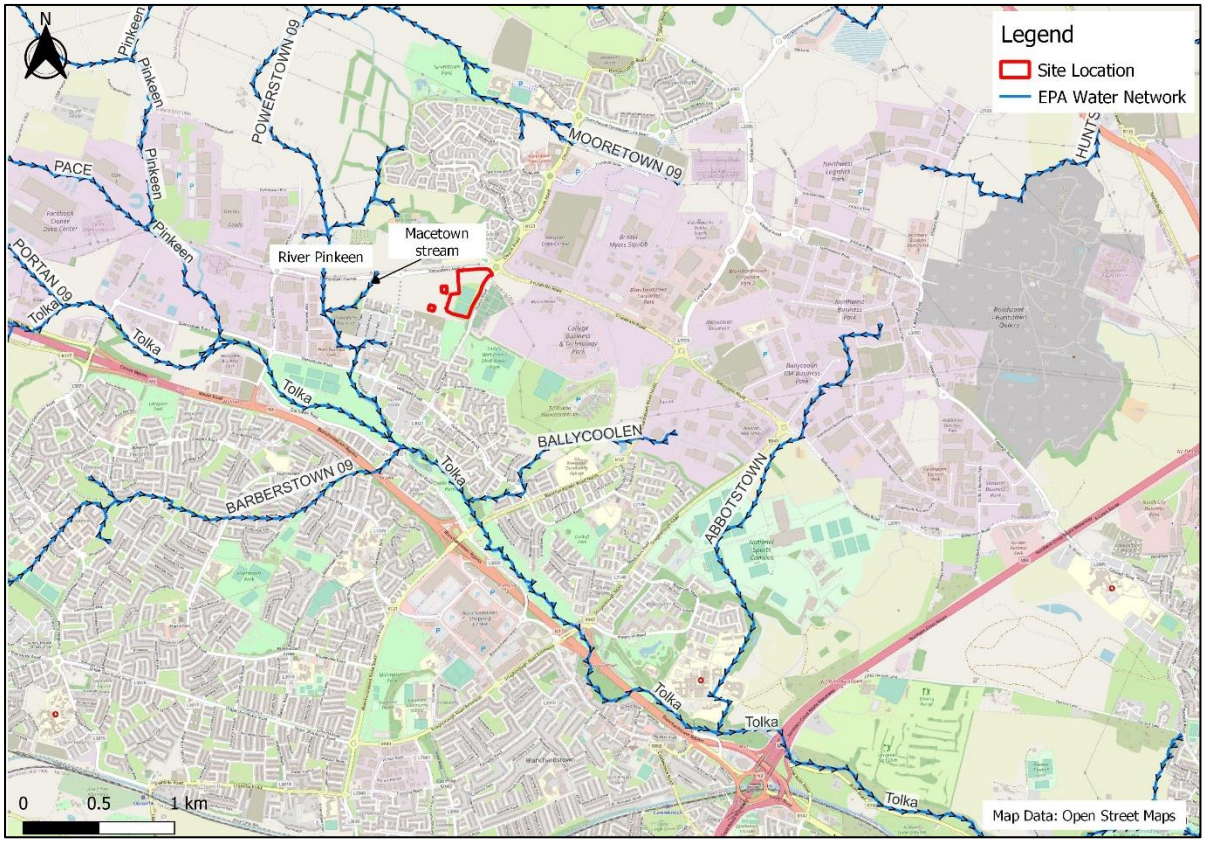


8.3.3 Surface Water Features

There are no significant watercourses within the proposed development site (see **Figure 8.3**), however it is located within the Tolka_SC_010' (09_10) sub-catchment of the Liffey and Dublin Bay (09) catchment.

A review of the Environmental Protection Maps (EPA) web-tool indicates that the Macetown stream (IE_EA_09T010800) flows c. 570m to the west of the proposed development site and runs south-west into the Pinkeen River (EPA name Powerstown 09, IE_EA_09T010800) which is c. 820 m to the west of the proposed development. The Pinkeen River runs south and in turn joins the River Tolka at Mulhuddart. The River Tolka flows into Dublin Bay via Tolka Estuary, approximately 14.8 km to the east (linear distance) of the proposed development site. Refer to **Figure 8.3**. The Tolka Estuary (IE_EA_090_0200) is classified as a Nutrient Sensitive Area under the Urban Waste Water Treatment Directive.

Figure 8.3 EPA waterbodies in the proximity of the proposed development



8.3.4 Rare and Protected Plant Species

The NPWS and NBDC databases were consulted with regard to rare species[14] and species protected under the *Flora Protection Order* (2022). According to the NBDC database, there are no known records of rare or protected plant species within the proposed development site or within the 2 km grid square (O04Q) that covers the site, and none were recorded during any of the site visits undertaken.

[14] Curtis & McGough (1988)

8.3.5 Invasive Alien Plant Species

No species listed on the Third Schedule of the Birds and Habitats Regulations 2011 (as amended), such as Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*), Himalayan balsam (*Impatiens glandulifera*) or three-cornered leek (*Allium triquetrum*) have been recorded at the proposed development site during the surveys undertaken in the preparation of this report.

Winter heliotrope (*Petasites pyrenaicus*) was recorded previously outside the eastern boundary of the proposed development along the beech treeline, west of Church Road. Previous control and eradication of the species has been undertaken as part of the planning application Church Fields Link Road & Cycle Network Permitted under FCC Ref.: PARTXI/011/19.

8.3.6 Habitats

The habitats present on the proposed development site are shown in **Figure 8.4,** below.

No habitats of notable ecological value are present within the proposed development site at Church Fields East. The majority of the site, south of a wooded ridge that crosses through the northern half, comprises amenity grassland (**GA2**). This section of the site is regularly mown and is species poor. The grassland is dominated by common grass species such as meadow grasses, bents, cock's-foot grass (*Dactylis glomerata*), crested dog's tail grass (*Cynosurus cristatus*) and false oat grass (*Arrhenatherum elatius*) and occasional wildflower species such as dandelion (*Taraxacum officinale*) and white clover (*Trifolium repens*).

There is a stand (**WL2**) of mature beech trees (*Fagus sylvatica*) outside the eastern site boundary, which separates the site from Church Road. A cycleway (permitted under FCC Planning Ref. No.: PARTXI/011/19) is under construction between the beech trees and the proposed development site.

To the west of the area of amenity grassland there is a grass-covered raised earth bank (**BL2**). The section of the site to the west of the earth bank comprises dry calcareous and neutral grassland (**GS1**). Further west (and outside the red line) the lands will be developed as part of the permitted Church Fields Housing and Eastern Linear Park Development (PARTXI/012/21). Species in this area include cowslip (*Primula veris*), creeping cinquefoil (*Potentilla reptans*), vetches (*Vicia cracca*, *Vicia sativa*), various grasses (*Festuca rubra*, *F. pratensis, Arrhenatherum elatius, Agrostis canina, A. stolonifera, A. capillaris, Poa annua, P. pratensis, Cynosurus cristatus*), bird's foot trefoil (*Lotus corniculatus*), selfheal (*Prunella vulgaris*) and various mosses.

To the north of the amenity grassland there is a large earth bank, with which is associated a semi-mature/mature tree line and hedgerow (**WL1/WL2**). Species associated with this feature include a group of tall white poplar (*Populus alba*) on the western side mixed group of trees in the eastern part, comprising hybrid black poplar (*Populus X canadensis*), sycamore (*Acer pseudoplatanus*), common alder (*Alnus glutinosa*), silver birch (*Betula pendula*), goat willow (*Salix caprea*), small-leaved lime (*Tilia cordata*), beech (*Fagus sylvatica*), and hawthorn (*Crataegus monogyna*). The understorey is species poor, being dominated by ivy (*Hedera helix*) and nettle (*Urtica dioica*).

The northern side of the treeline/hedgerow comprises rough ground, with scrub (**WS1**) encroaching. This scrub comprises bramble (*Rubus fruticosus* agg,) and nettle, with saplings of various tree species, including oak (*Quercus* sp.) also becoming established.

Further north again, the scrub gives way to more open dry calcareous and neutral grassland (**GS1**), but with bramble and nettle scrub beginning to dominate. There is an existing boundary wall that traverses

the northern grassland and ends abruptly close to the eastern field boundary. The north-eastern section comprises of bare ground covered in spoil and rubble (ED2).

Refer to Figures 8.5 to 8.8 below.

Figure 8.4 Habitat map for the proposed development site at Church Fields East

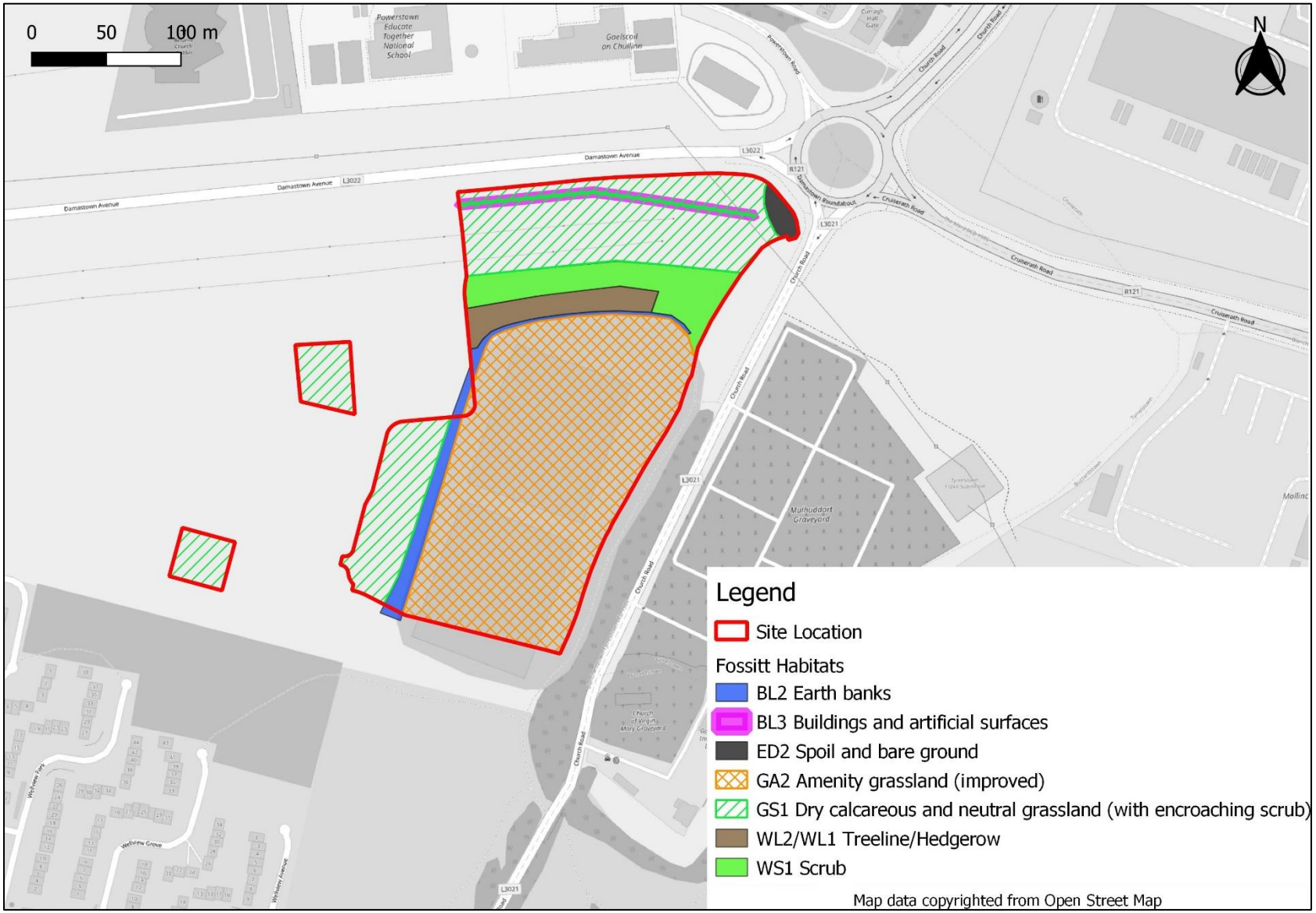


Figure 8.5 Stand (WL2) of mature beech trees, existing footpath, cycle way (under construction) outside the eastern site boundary and amenity grassland (GA2) within the site.

Figure 8.6 The proposed development site comprising of amenity grassland (GA2) and wooded ridge crossing the northern half

Figure 8.7 Dry calcareous and neutral grassland (GS1) and scrub (WS1) to the north of the treeline within the site

Figure 8.8 Existing wall traversing the northern grassland and the north-eastern section comprising of bare ground covered in spoil and rubble (ED2).

8.3.7 Fauna

8.3.7.1 Birds

All of the bird species recorded within the proposed development site are very common in Ireland. Species recorded during the course of the surveys undertaken in the preparation of this EIA chapter included blackbird (*Turdus merula*), blue tit (*Cyanistes caeruleus*), goldfinch (*Carduelis carduelis*), robin (*Erithacus rubecula*), song thrush (*Turdus philomelos*), wood pigeon (*Columba palumbus*), wren (*Troglodytes troglodytes*), jackdaw (*Corvus monedula*), rook (*Corvus frugilegus*) and magpie (*Pica pica*).

All of these species are on the green list of Birds of Conservation Concern in Ireland (BoCCI) (2020 – 2026)[15], indicating that they not currently species of conservation concern.

An appraisal of the site was undertaken to assess its suitability for use by birds that favour open farmland or grassland, such as pale-bellied Brent goose (amber list). However, no signs of these or any similar species were recorded and the site itself is not of any significant value for these species.

Birds, as well as their nests and eggs, are fully protected under the Wildlife Act (1976) and subsequent amendments.

8.3.7.2 Bats

There are no buildings or other structures on the site. As noted in the bat survey report included at Appendix 8.1 of the EIAR, none of the trees within the project red line itself are of significant value for roosting bats and the line of beech trees is entirely outside the proposed development site. It is separated from it by a cycleway, currently under construction.

Three species of bat – common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's bat (*Nyctalus leisleri*) – were recorded feeding within the Church Fields lands during the surveys undertaken. The beech trees outside the proposed site boundary on the east have high bat roost potential.

As noted in the bat survey report (in relation to the beech trees to the east of the site):

> *None of the bats were seen to enter or leave the trees on site prior to sunrise or to emerge at sunset. There was one Leisler's bat mating perch within the substantial beech trees on the eastern edge of the site in 2021 and a Leisler's bat was noted in this area prior to sunrise in 2022. This tree is therefore a bat roost, but it is not a maternity roost. A soprano pipistrelle activity was noted around trees prior to sunrise in 2020 but the final destination of the bat was not discovered.*
>
> *Leisler's bat activity was relatively high within the site, over the grassland and towards the mature line of beech trees.* […] *Leisler's bats were present after sunset and prior to sunrise and it is probable that roosts are present close to the site, but no maternity roosts or other Leisler's bat daytime roosts were confirmed during these surveys.*

All Irish bat species are fully protected under the Wildlife Act (1976) and subsequent amendments, and under the *EU Habitats Directive*, via the *European Communities (Birds and Natural Habitats) Regulations, 2011-2021*.

8.3.7.3 Large Mammals

No evidence of badger activity was recorded during the surveys carried out as part of the current planning application. Similarly, no evidence of otters has been recorded within the proposed development site, or along any of the drainage ditches in the area.

Badgers are fully protected under the Wildlife Act (1976) and subsequent amendments. Otters are fully protected under the Wildlife Act (1976) and subsequent amendments, and in the European Communities (Birds and Natural Habitats) Regulations, 2011-2021.

[15] https://birdwatchireland.ie/app/uploads/2021/04/BOCCI-2020-2026.pdf

Foxes and rabbits, which are not protected under wildlife legislation, were seen at the site by the author on numerous occasions.

8.3.7.4 Other Species

Overall, the proposed development is dry with no drainage ditches. The site does not provide suitable breeding habitat for amphibians (newts and frogs). No evidence of amphibians were recorded on the site during the surveys undertaken.

No evidence of common lizard has been recorded. While it is possible that lizards may occur within the site, the area of suitable habitat (such as exposed rock) is negligible.

The site was assessed for the presence of butterflies and for the suitability of the habitats for butterfly abundance and diversity. No evidence of Ireland's only protected insect, the marsh fritillary butterfly, or its food plant (devil's bit scabious (*Succisa pratensis*)) was recorded on the site.

8.3.8 Overall Evaluation of the Proposed Development Site

The proposed development site is not under any wildlife or conservation designation. There are no designated sites on the site of the proposed development or in the immediate vicinity. Furthermore, no rare, threatened or legally protected plant species, as listed in the *Irish Red Data Book 1 – Vascular Plants (Curtis & McGough, 1988)*, the Flora (Protection) Order, 2022 (SI No. 235 of 2022) or the Habitats Directive, are known to occur within the site.

No rare habitats or habitats of particularly high ecological value (i.e. International, National or County Importance) are present at the site. No rare plants have been recorded during any of the site visits undertaken.

All of the bird species recorded are very common, and no red-listed species were noted. The site does have value for commuting and foraging bats, and for breeding birds. The site is not utilised by any wintering bird species, including those species listed as SCI species in any European sites.

No evidence of badger activity was recorded during the surveys carried out as part of the current planning application. No evidence of otters has been recorded within the proposed development site, or along any of the drainage ditches in the wider area.

No evidence of amphibians or reptiles has been recorded in the vicinity of the proposed development site.

The hedgerow/treeline loss, required in order to facilitate the proposed development will be addressed by additional planting along the eastern site boundary as detailed in the Landscape Design Statement, prepared by Brady Shipman Martin and submitted separately.

Overall the site is of no more than **Local Importance (Lower Value)** as defined by the ecological resource valuations presented in the National Roads Authority/Transport Infrastructure Ireland Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA/TII, 2009 (Rev. 2)).

8.4 Predicted Impacts of the Proposed Development

8.4.1 Construction Phase

8.4.1.1 Designated Conservation Areas

The potential for any significant effects on European designated sites (sites designated for nature conservation under the EU Habitats and Birds Directives) has been assessed separately, and a stand-alone report (AA Screening Report), compiled in consultation with the wider design team including the project engineers, has been prepared for submission as part of the overall planning application and is submitted under separate cover.

Based on the studies undertaken and the features of the proposed development, the AA Screening process concluded that none of the habitats and species listed as qualifying interests or special conservation interests in any European site designation will be affected by the proposed development and full AA, including the preparation of a Natura Impact Statement (NIS), is not required. The following paragraphs are extracted from the AA Screening report conclusions:

> *In view of best scientific knowledge, this report concludes that the proposed development at Church Fields East, Mulhuddart, Dublin 15, individually or in combination with another plan or project, will not have a significant effect on any European sites. This conclusion was reached without considering or taking into account mitigation measures or measures intended to avoid or reduce any impact on European sites.*
>
> *It is considered that this report provides sufficient relevant information to allow Fingal County Council to carry out an AA Screening, and to reach a determination that the proposed development will not have any likely significant effects on European sites under Article 6 of the Habitats Directive in light of their conservation objectives.*

Similarly, there is no direct or indirect pathway between the proposed development site and any pNHA not already designated as a European site, and therefore no impacts on any pNHA will occur.

8.4.1.2 Habitat Loss and Disturbance

None of the existing habitats on the site at Church Fields East are of more than local ecological significance.

As the design and layout of the proposed development has evolved, detailed consideration has been given to incorporating landscape and ecological features into the final design, with significant areas of open space being provided throughout the site. This includes a central pocket park, eastern open space and landscape buffer area along Damastown Avenue to the north along with additional open space under the overhead electricity cables that bound the site to the north-east. Furthermore, a 2.2 hectare Eastern Linear Park (previously permitted) runs to the south of the site. The landscape design (by Brady Shipman Martin) builds on the existing features.

The landscape design includes open space features along the eastern boundary of the proposed development which will tie in with the cycle track and green infrastructure outside the eastern site boundary and along with the linear park proposed to the south of the development (permitted under PARTXI/012/21).

The removal of the trees and shrubs in the northern part of the site required in order to facilitate the proposed development, will be addressed by additional planting along the eastern site boundary as

detailed in the Landscape Design Statement, prepared by Brady Shipman Martin and submitted separately.

The development for housing on the remainder of the site will result in the removal of the existing amenity grassland.

- In the absence of mitigation, the loss of the amenity grassland as well as the removal of treeline / hedgerow and scrub in the northern part of the site is considered to be a **permanent, minor to moderate impact at the site level**.
- However, the extensive landscaping and planting proposed, including the provision of the boundary tree lines along eastern side as well as the provision of the open spaces throughout the site will, over time, reduce this impact to **neutral** or **slight positive**.

8.4.1.3 Disturbance to or Loss of Habitat for Fauna

The removal of the treeline / hedgerow in the northern part of the site will result in minor impacts on nesting birds and commuting / foraging bats. It is not expected that these impacts will be significant, particularly in view of the fact that the landscaping proposed (refer to the Landscape Report) will provide new and replacement habitat (feeding and nesting) for birds. There will be no impacts on wintering birds as a result of the proposed development.

As noted in the Bat Survey Report (**Appendix 8.1**) no bat roosts were recorded on the site, however bats are highly mobile creatures, and may use small features in trees (cracks, fissures) for roosting occasionally. Therefore, in the absence of mitigation, the loss of trees is a potential **long-term moderate negative impact at the site level**. There are however few high-quality trees within the boundary of the site. It is not expected that any bat roosts will be lost. None of the beech trees, outside the site boundary and containing features that could be used by roosting bats, will be affected by the proposed development.

As set out in **Section 8.5**, this mitigation will include the installation of bat boxes prior to the commencement of development, as well as pre-felling checks of all trees to be removed.

There will be a loss of ground flora and of trees and hedgerow (varying between poor and moderate quality) which provide shelter for insects and areas for bats to feed. This will reduce insect abundance and feeding and commuting corridors. In the absence of mitigation this is a **long-term to permanent moderate negative impact at the site level** without the implementation of mitigation.

At present the site is an unlit field with no significant light overspill. Lighting may affect bat species, in particular, light-intolerant bat species during foraging, and if directed at emergence points would affect all bat species, even those that will feed in illuminated areas. This is a potential **long-term, moderate, negative impact at the site level** without the implementation of mitigation.

Badgers and their setts will not be directly affected by the proposed development. No badger activity has been recorded anywhere within the study area at Church Fields East. No direct or indirect impacts on badger setts or badger territories are expected as a result of the proposed development. Even so, the landscape design proposed includes the maintenance and creation of habitat corridors within the site and connecting to the wider area, meaning that, should badgers occupy territories in the vicinity in the future, they will be able to access the parkland and open space areas.

There will be no significant impacts on reptiles, lepidoptera, amphibians or any other species groups as a result of the proposed development.

The implementation of biosecurity measures will ensure that no transfer of invasive plant material takes place during the construction phase that could potentially lead to species such as giant hogweed or Japanese knotweed becoming established in the area. Biosecurity measures as set out in **Appendix 8.2** (Outline Biosecurity Plan) will be implemented to minimise the risk of introduction / dispersal of invasive species to the proposed development site.

8.4.1.4 Water Quality, Dust and Other Emissions

Both the construction and operational phases of the proposed development at Church Fields East could have impacts on air and water quality, via dust and contaminated run-off and sedimentation. However, all construction works will proceed in line with the measures provided in the Construction & Environmental Management Plan (CEMP) for the proposed development (prepared by Brady Shipman Martin and submitted under separate cover). See also Chapters 9 (Land, Soils, Geology & Hydrogeology) and 10 (Hydrology), as well as Chapter 11 (Air Quality) and Chapter 12 (Climate) prepared by AWN Consulting, for further information and specific mitigation. Localised contamination from dust, foul water, hydrocarbons, silt or other pollutants will be prevented by these mitigation measures.

- Provided that site facilities are correctly designed and proper working procedures are strictly adhered to, **no impacts on existing air quality or on watercourses are expected**, either during the construction or operation of the proposed development.

8.4.2 Operational Phase

8.4.2.1 Impacts of Lighting from the Proposed Development

As noted in **Section 8.4.1.3** increased lighting and increased human activity have the potential to impact on bat feeding and commuting behaviour. The proposed lighting for the development has been designed by Sabre Electrical Services Ltd. and has had regard to the following guidelines:

- *Bats and Lighting – Guidance Notes for Planners, Engineers, Architects and Developers* (Bat Conservation Ireland, 2010);
- *Guidance Notes for the Reduction of Obtrusive Light GN01* (Institute of Lighting Professionals, 2011); and
- *Bats and Lighting in the UK – Bats and the Built Environment Series* (Bat Conservation Trust UK, 2018).

Provided that the lighting is installed as designed, ***no impacts on bats are expected***, either during the construction or operation of the proposed development. There will be no light spill on the line of beech trees outside the eastern boundary of the site as a result of the proposed development.

8.4.2.2 Discharges to Surface Water from the Proposed Development

As per the Engineering Assessment Report, prepared by Waterman Moylan (2023) and submitted under separate cover as part of this application, all attenuated surface water run-off from the proposed development will ultimately outfall into the Pinkeen River to the far west of the site.

It is proposed to use a SuDS approach to storm water management throughout the site. SuDS are a requirement of Fingal County Council under the *Greater Dublin Strategic Drainage Strategy* (GDSDS) Regional Regional Drainage Policies Volume 2, for New Developments. Additionally, these systems are recommended under the 2009 guidelines published by the OPW, *The Planning System and Flood Risk Management* ('the OPW Guidelines'). All surface water calculations utilised in the drainage design

include additional capacity (20%) to account for climate change. As confirmed in the AA Screening Report, even in the total absence of any SuDS measures there would be no impacts on the European sites of Dublin Bay. The natural characteristics of the bay ensure rapid mixing of water such that there is no appreciable effect on water quality in European sites.

- Operational impacts related to surface water (or ground water) management, in the context of biodiversity, as a result of the proposed development, will ***not be significant***.

A Site-Specific Flood Risk Assessment (FRA) has been prepared by Waterman Moylan (2023) and submitted under separate cover. The SSFRA indicates that the proposed development site is located within Flood Zone C, which, according to the OPW Guidelines, is suitable for all kinds of development, including residential developments such as that proposed, which are classified as "highly vulnerable".

- Operational impacts related to flooding, in the context of biodiversity, as a result of the proposed development, will ***not be significant***.

8.4.2.3 Discharges to Foul Sewer from the Proposed Development

As per the Engineering Assessment Report, prepared by Waterman Moylan (2023), a new foul network will be constructed. A Statement of Design Acceptance from Uisce Éireann, dated 18th May 2023, has been received by the engineers and is included in Appendix C of the Engineering Assessment Report submitted as part of this planning application. It states that Uisce Éireann has no objections to the proposals.

It is proposed that the foul water from the proposed development will drain by gravity in a south-western direction and discharge into the existing 900mm foul water trunk sewer located along the western boundary via a single outfall. Drains generally will consist of PVC pipes and all foul water sewers within the development will be laid to comply with the requirement of the Building Regulations and in accordance with the recommendations contained in the Technical Guidance Documents, Section H. Wastewater sewers which will be taken into charge will be laid strictly in accordance with Uisce Éireann's requirements for taking in charge.

As per the Irish Water Wastewater Code of Practice, the domestic wastewater loads have been calculated based on 2.7 persons per unit with a per capita foul flow of 150 litres per head per day. The total dry weather flow from the development is 1.119 l/s, with a peak flow of 6.716 l/s. A peak foul flow factor of 6 has been used, as per the Irish Water Wastewater Code of Practice. The outfall pipe from the development has sufficient capacity to serve all of the future development on the Church Fields lands, and outfall into the existing 900mm diameter infrastructure located approximately 800m to the west of the site which ultimately flows to Ringsend Wastewater Treatment Plant (WwTP).

The Ringsend WwTP operates under licence from the EPA (Licence no. D0034-01) and received planning permission (ABP Reg. Ref.: 301798) in 2019 for upgrade works, which are expected to be completed within five years. This will increase the plant capacity from 1.65m PE (population equivalent) to 2.4m PE. Regardless of the status of the WwTP upgrade works, the peak discharge from the proposed development is not significant in the context of the existing capacity available at Ringsend. Though the WwTP is currently over capacity (the plant is currently accommodating 1.9m PE), recent water quality assessment undertaken in Dublin Bay (published by the EPA) confirms that Dublin Bay is classified as "*unpolluted*", indicating that the over-capacity issues at Ringsend are not having any impacts on water quality in Dublin Bay. Regardless of the foregoing, the loading from the proposed development (peak

foul flow- 6.713l/s) is inconsequential in the context of the WwTP. Therefore, there is adequate capacity in the public foul sewer available to cater for the proposed development.

- Operational impacts related to foul water management, in the context of biodiversity, as a result of the proposed development, will ***not be significant***.

8.5 Mitigation Measures

8.5.1 Construction Phase

8.5.1.1 Incorporated Design Mitigation

The proposed development incorporates a comprehensive landscape design, with biodiversity-focussed planting (refer to Chapter 14 (Landscape & Visual, prepared by Brady Shipman Martin) and the Landscape Design Statement and Landscape Masterplan drawings (prepared by Brady Shipman Martin and submitted as part of this application under separate cover). The planting and long-term management proposed in the Landscape Design Statement will enhance the biodiversity resource on the proposed development site by enhancing the retained habitats and creating new, pollinator-friendly habitats.

8.5.1.2 Designated Conservation Areas

No designated conservation areas will be impacted in any way by the proposed development and no mitigation measures are required in this regard. Refer to the AA Screening Report that accompanies the planning application for full details in relation to European designated sites.

8.5.1.3 Habitats

There will be no significant habitat loss as a result of the proposed development, and no significant impacts on Key Ecological Receptors.

The tree felling works will be carried out by a qualified and experienced tree surgeon in accordance with *BS3998 (2010) Tree Work – Recommendations*. The Tree Survey Report recommends erecting sturdy tree protection fencing or suitable site hoarding to prevent construction work encroaching the root protection areas of the beech trees outside the eastern site boundary and the hedgerow to the south (outside the red line) of the proposed development. Where machinery encroaches the RPAs of trees around the site under unforeseen and unavoidable circumstances; suitable ground protection will be put in place to prevent any significant soil compaction or root damage near the trees. This includes suitable strength ground protection mats or cellular confinement system capable of supporting the appropriate weight.

The Tree Survey Report recommends transplanting the young oak saplings from the scrub clearance area in the northern part of the site. The Brady Shipman Martin Landscape Design Statement similarly recommends incorporating these oak saplings within the landscaped areas along the eastern site boundary. These young trees will be protected with tree protection fencing prior to works commencing. The fencing will be retained in place until such time as the trees can be transplanted.

As set out in the Landscape Design Statement and Landscape Masterplan drawings, a significant amount of new planting has been incorporated into the landscape design, and the planting has been designed with a view to maximising the new biodiversity resource at the proposed development site. The proposed planting / landscaping strategy includes a mix of appropriate species, incorporating species

that will attract feeding invertebrates, including moths, butterflies and bees. It takes account of and implements the policies and objectives of the *All-Ireland Pollinator Plan (2021 - 2025)*[16]. Low-maintenance tree groups and wildflower meadows are being provided, as are nest boxes and insect hotels and areas of bare ground (for solitary bees).

To the south of the proposed development, 2.2 hectares of Class 1 Open Space has been provided as Eastern Linear Park (previously permitted under FCC Ref. PARTXI/012/21). Class 2 open space will be provided within the site boundary in central pocket park (2,000sqm) and eastern open space (5,600sqm). Additional open space (3,200sqm) will be provided under the overhead powerlines in the north-east corner of the site. Finally, communal open space is proposed for each of the apartment blocks along with a landscape buffer area along Damastown Avenue to the north of the site.

The proposed planting schedule contains no invasive species and none will be introduced, either deliberately or inadvertently, to the proposed development site. As noted in Section 8.4.1.3 appropriate biosecurity measures will be implemented during the construction phase of the proposed development under the scope of a Biosecurity Plan (refer to Appendix 8.2 – Outline Biosecurity Plan).

8.5.1.4 Fauna

The clearance of scrub and other vegetation that may be suitable for use by nesting birds will be undertaken outside the bird nesting season (avoiding the period 1 March to 31 August). Should the construction programme require vegetation clearance between March and August, and this is unavoidable, bird nesting surveys will be undertaken by suitably qualified ecologists. If no active nests are recorded, vegetation clearance will take place within 24 hours. In the event that active nests are observed, an appropriately sized buffer zone (up to 5 m radius around the nest) will be maintained around the nest until such time as all the eggs have hatched and the birds have fledged – a period that may be three weeks from the date of the survey. Once it is confirmed that the birds have fledged and no further nests have been built or occupied, vegetation clearance may take place immediately.

There will be no impacts on badgers or other large mammals. Regardless, a pre-construction check for badgers will be undertaken prior to the commencement of construction, to ensure this remains the case.

As bats are highly mobile creatures, a bat specialist shall examine the trees (i.e. the poplar trees and others in the northern part of the site) for bat roost potential and for the presence of bats before felling commences. The trees shall be assessed by a bat specialist from height if due for felling in winter or by a bat detector assessment (or a combination of both) if felling occurs at any other time. The discovery of any bat roosts, albeit unlikely, shall require a derogation from the National Parks and Wildlife service.

If a bat survey has been undertaken by a bat specialist and bats have been determined to be absent, felling may proceed under the supervision of a bat specialist. If there is any doubt regarding the presence of bats, access from height shall be provided to allow the examination of any trees with roost potential prior to felling.

It is proposed to install a significant number of bat and bird boxes both throughout the proposed development site. The reason for the installation of bat boxes is not to provide replacement roosts;

[16] NBDC (2021)

rather, it is to augment the overall ecological value of the site. This will contribute to maximising the ecological value of the proposed development.

To that end a number of bat and bird boxes will be erected, with advice from the project Ecologist, in appropriate areas (within unlit areas away from traffic and likely disturbance within the site, no less than 3m above the ground in uncluttered areas, facing in a southerly direction). The locations of the bat boxes shall be agreed with a bat specialist. A total of four combined bat/swift bricks, or equivalent, will be installed.

Bats are sensitive to light at night, and the lighting design will ensure that the proposed development will not result in impacts on bats that do commute / forage in or near the proposed development site.

The lighting design for the proposed development (see **Section 8.4.2.1**) includes the following measures:

- Where human safety permits it, dark corridors and dark areas will be incorporated into the open space and landscape design for the proposed development;
- All luminaires shall lack UV elements when manufactured and shall be LED;
- A warm white spectrum shall be adopted to reduce blue light component;
- Luminaires shall feature peak wavelengths higher than 550 nm;
- Tree crown shall remain unilluminated. Specifically, no light spill will impact on the beech trees to the east of the proposed development site.

8.5.1.5 Surface Water

There will be no surface water related impacts on biodiversity as a result of the proposed development.

The surface water mitigation measures proposed in Chapter 10 (Hydrology) and in the CEMP, to be finalised by the appointed contractor in agreement with Fingal County Council, will ensure that no sediment contamination, contaminated run-off or untreated wastewater will enter any on-site surface water ditches and drains and, in particular, the Pinkeen River and River Tolka (downstream of the site) as a result of the construction of the proposed development.

8.5.2 Operational Phase

8.5.2.1 Foul Water

As noted in **Section 8.4.2**, there will be no impacts on foul water treatment capacity at the Ringsend WwTP as a result of the proposed development. No mitigation measures are required.

8.5.2.2 Surface Water

There will be no impacts related to surface water, including on downstream rivers, as a result of the proposed development. The proposed development is designed in accordance with the principles of SuDS as embodied in the recommendations of the GDSDS, which addresses the issue of sustainable water management by requiring designs to comply with a set of drainage criteria which aim to minimize the impact of urbanization, by replicating the run-off characteristics of the greenfield site. The criteria provide a consistent approach to addressing the increase in both rate and volume of run-off, as well as ensuring the environment is protected from any pollution from roads and buildings. No corresponding mitigation measures are required.

8.6 Residual Impacts

Overall, although the proposed development may have temporary negative impacts on biodiversity at the site level, these impacts will be fully mitigated over time and there will be **no long-term, residual impact**.

There will be no negative impacts on habitats or fauna following the full and proper implementation of the mitigation measures set out in this EIAR chapter.

8.7 Monitoring

A suitably experienced Project Ecologist will be appointed for the duration of the construction phase and regular monitoring of all related works will take place to ensure the correct and full implementation of all mitigation measures. The Project Ecologist will ensure that all construction works take place in accordance with planning conditions, the project CEMP and the mitigation measures set out in this EIAR.

As noted in **Section 8.5.1.4**, vegetation clearance will only be permitted outside the bird-nesting season. Should vegetation clearance be required during the bird nesting season, and should this work be unavoidable, such clearance will take place only after the Project Ecologist has undertaken a survey to ensure that no active bird nests or recently fledged birds are present. Pre-construction surveys will be required to ensure that any necessary tree felling or works to buildings continue to have no impact on roosting bats.

No long-term ecological monitoring is required, other than post-construction monitoring of the bat and bird boxes installed. The bat and bird boxes installed on the site will be checked annually for a period of two years post-completion of the works, to ensure that they continue to be accessible to these species. If necessary they will be repositioned within the site.

On completion of construction, the lighting installed will be reviewed by the Project Ecologist and a bat specialist, to ensure that it is operating according to the approved specifications.

8.8 Reinstatement

The long-term management of the proposed development will incorporate best practice measures to maintain and enhance the level of biodiversity at the site.

Given the comprehensive mitigation and landscape design proposed, no other ecological reinstatement is required.

8.9 Interactions

At the proposed development site, the main interactions of importance to biodiversity relate to Landscape & Visual (Chapter 14), Hydrology (Chapter 10), Land, Soils, Geology & Hydrogeology (Chapter 9), Air Quality (Chapter 11). The mitigation measures for the proposed development have been designed to minimise the potential impact that the construction and operational phases may have on the receiving environment.

8.9.1 Land, Soils, Geology & Hydrogeology (Chapter 9)

Effects and impacts in relation to the geological and hydrogeological environment have the potential to negatively affect biodiversity. For example, soil stripping and excavations on the site will result in the

loss of existing habitats. There is also the potential for negative impacts on aquatic ecology due to discharge of sediment-laden run-off and / or groundwater pollution during the proposed works.

8.9.2 Hydrology (Chapter 10)

Effects and impacts in relation to surface water have the potential to negatively affect biodiversity. For example, unmitigated water quality impacts may result in negative impacts on aquatic ecology.

8.9.3 Air Quality (Chapter 11)

Dust emissions from construction works have the potential to impact vegetation in the vicinity of the site. Vehicular emissions during construction and operation also have the potential to impact vegetation as a result of NOx emissions leading to nitrogen deposition.

8.9.4 Landscape & Visual (Chapter 14)

The landscape design for the proposed development takes into account the requirements to maximise the benefits to biodiversity, both locally and within the wider landscape. The landscape scheme (refer to Chapter 14 and the Landscape Design Statement, BSM, 2023 and submitted as part of this application under separate cover) proposes significant ecologically sensitive planting to provide for potentially diverse habitats.

As noted in Chapter 20 (Interactions) the potential significant impacts of biodiversity have been considered within the relevant discipline, and mitigation measures outlined, where required. With mitigation measures in place, no significant residual negative impacts are predicted.

8.10 Cumulative Impacts

This chapter has been prepared with reference to the list of other developments in the vicinity set out in Chapter 21 (Cumulative Impacts). Neither the development proposed nor any other developments will give rise to any significant impacts on biodiversity and there are no predicted cumulative impacts in relation to biodiversity, for example in terms of habitat loss or disturbance to protected species, as a result of the proposed development in combination with existing / proposed plans or projects.

8.11 Difficulties Encountered

No difficulties were encountered in compiling the Biodiversity Chapter of this EIAR. All surveys were undertaken to an appropriate level, given the nature of the site and the proposed development.

8.12 Conclusion

There will be ***no long-term residual impact*** on ecological receptors, either within or in the vicinity of the proposed development, or associated with any site designated for nature conservation as a result of the proposed development.

8.13 References

- Bat Conservation Ireland (2010). Bats and Lighting – Guidance Notes for Planners, Engineers, Architects and Developers
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- Council 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 (The Water Framework Directive)
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9 Land, Soils, Geology & Hydrogeology

9.1 Introduction

This Chapter assesses and evaluates the potential impacts of the Proposed Development described in Chapter 5 (Description of the Proposed Development) on the land, soils, geological and hydrogeological aspects of the site and surrounding area. In assessing likely *potential* and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects. The impact on hydrology is addressed in Chapter 10 (Hydrology).

This Chapter has been written by Hana Blandford Environmental Scientist AWN Consulting and Teri Hayes Senior Hydrogeologist AWN Consulting. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

9.2 Method

9.2.1 Criteria for Rating Effects

The Chapter has been prepared in accordance with European Commission's guidelines, *Guidance on the preparation of the Environmental Impact Assessment Report* (2017), the EPA *Guidelines on the information to be contained in EIAR* (2022) and the EU Commissions *Notice on changes and extensions to projects (2021).*

The appraisal methodology for the EIAR is completed in accordance with 'Guidelines on the Information to be contained in Environmental Impact Statements' (EPA, 2022) and Institute of Geologists of Ireland (IGI) '*Geology in Environmental Impact Statements, a Guide'*, (IGI, 2002) and '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'* (IGI 2013). In addition, '*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes'* by the Transport Infrastructure Ireland (TII, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental impacts on the land, soils and geological environment is based on the quality, significance, duration, and type of impact characteristic identified. Consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that cited attribute. The EIAR guideline tables (EPA, 2022) are presented in Appendix 9.1. The IGI and TII criteria for rating the magnitude and significance of impacts at EIA stage on the geological related attributes are also relevant in determining impact assessment.

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The principal attributes (and impacts) assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the subject site;
- Landfills & industrial sites & graveyards in the vicinity of the site and the potential risk of encountering contaminated ground;

- The quality, drainage characteristics and range of agricultural uses of soil around the site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well or requirement to remove it off-site as waste for disposal or recovery;
- High-yielding water supply springs/wells in the vicinity of the site to within a 2 km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the proposed development associated with aspects of the development for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;
- Natural hydrogeological/karst features in the area and potential for increased risk presented by the activities at the site; and
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally.

9.2.2 Sources of Information

Desk-based geological information on the substrata (both Quaternary deposits and bedrock geology) underlying the extent of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1: 100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register; and
- Fingal County Council - illegal landfill information.

Site specific data was derived from the following sources:

- Engineering report by Ground Investigations Ireland, Churchfields, Waterman Moylan, Ground Investigation Report, April 2023 - (Ground Investigations Ireland “GII”, 2023);
- Engineering Assessment Report, Church Fields East, Mulhuddart, Dublin 15, Waterman Moylan – (EAR, 2023)
- Outline Construction Environmental Management Plan (OCSC, 2023);
- The proposed development design site plans and drawings; and Consultation with the project design engineers.
- EPA (2023). EPA Maps.
- GSI (2023). GSI Map Viewer.

9.3 Baseline Environment

The receiving environment is discussed in terms of; land geology, soils, hydrogeology, and site history including potential for contamination.

The proposed development site is c.5.52 hectares at Church Fields East, Mulhuddart, Dublin 15. The development site is located south of Damastown Avenue; west of Church Road; east of previously

permitted residential development at Church Fields (Planning Reg. Ref.: PARTXI/012/21); and north a permitted linear park (Eastern Linear Park Planning Reg. Ref.: PARTXI/012/21), in the townland of Tyrrelstown, Dublin 15. The site is located west of protected structure RPS No. 670 Mulhuddart Church (in ruins) & Graveyard, which is located east of Church Road.

The baseline is described based on desk study assessment and site-specific data derived from site investigation (S.I). The SI undertaken is presented in **Figure 9.1** below (Note the GII Report relates to a wider area, including lands to the immediate west of the site, where residential development has been previously permitted under FCC Ref.: PARTXI/012/21). Relevant borehole logs and soil quality data are included in **Appendix 9.2**.

Figure 9.1 Site Investigation Locations (Source GII report, 2022)

9.3.1 Topography and Setting

The topography is relatively consistent with the site falling from north-east to south-west at a natural slope of c. 1:54, ranging in levels from 87.00m to 80.00m OD Malin (EAR, 2023).

9.3.2 Areas of Geological Interest, Historic & Current Land-Use

Review of the GSI online data base confirmed that no geological heritage site has been identified in the vicinity of the proposed development site. The closest County Geological Site is Huntstown Quarry c.4.5km east of the site.

Full details of the site history and previous land use are included in Chapter 15 Cultural Heritage, Archaeology & Architectural Heritage. An assessment of site history (OSI, 2023) confirms that the site has been in agricultural use per the earliest mapping available (**Figure 9.2 to 9.4**). According to the EPA website, there are a number of licensed facilities in the locality (BMS, Ipsen Manufacturing Ltd., Alexion,

Mallinckrodt, and Hitech Plating Ltd.). An Amazon Datacentre is also located c.1 km to the north-east of the site. There is a "GetCar", and "Advanced Auto Centre" companies located directly north-east (adjacent) of Church/graveyard. Both are hydrogeologically down gradient of the proposed development.

There are no licensed waste sites in the vicinity of the site. Previous consultation with FCC confirmed that there are no known Section 22 illegal landfills or other historic landfills within 1 km of the site. This has been confirmed by subsequential site investigations at the site.

Mulhuddart graveyard is located to the immediate east of the site. The older graveyard has historically been hydrogeologically down gradient of the proposed development and separated by what is now known as Church Road. The Church and graveyard date to 1615. The newer graveyard is across gradient from the proposed development.

A review of historical mapping 1829 to current; source Geohive mapping) shows the land has always been in agricultural use. A road traversing the north portion of the site (west-east orientation) become an unestablished route by 2004. The junction in the north-east of the site (adjacent to the boundary) is closed down. This road essentially becomes a dead end, functioning as an access road to the development.

9.3.3 Soils

The general lithological/geological sequence of the overburden within this area of Dublin comprises the following unit (**Table 9.1**):

Table 9.1 Superficial Deposits in Dublin Region

Superficial Deposits
Made Ground
Estuarine/alluvial clays and silts
Estuarine/alluvial gravels and sands
Glaciomarine clays, silts, and sands
Glacial Till (drift)
Glacial gravels and sands

The regional overburden deposits are reflective of the Quaternary geological period that extends from around 1.5 million years ago to the present day. This can be further sub-divided into the Pleistocene Epoch, which covers the Ice Age period, and which extended up to 10,000 years ago and the Holocene Epoch, which extends from that time to the present day.

Figure 9.2 presents the soil type predominantly covering the site area; this is classified as BminDW – Basic Deep Well Drained Mineral (grey, brown podzolics, brown earths) (Source: GSI/Teagasc soil mapping). An area to the mid - west of site are soils composed of BminPD - surface water gleys/groundwater gleys basic (Source: GSI/Teagasc soil mapping). An area of made ground is shown to the east of the site boundary line and includes Mulhuddart graveyard.

Figure 9.2 Soils Map for the Proposed Development site (boundary indicated in red) (Source: www.gsi.ie)

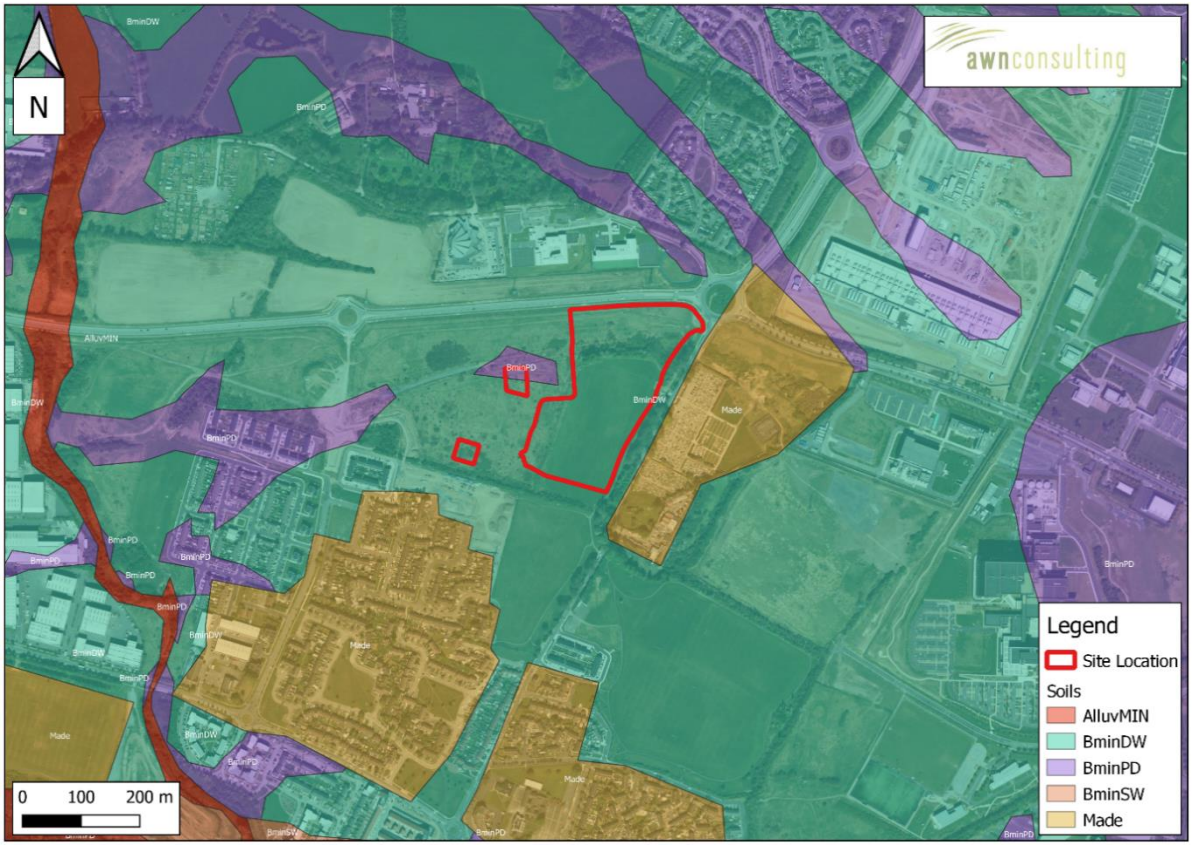


Figure 9.3 illustrates the subsoil types found surrounding the site. The subsoil type located at the proposed development is predominately classified as TLs – Till type subsoil comprising Limestone till (Carboniferous of variable texture).

Figure 9.3 Subsoils Map for the Proposed Development site (boundary indicated in red) (Source: www.gsi.ie)

Depth to bedrock has been shown to be very shallow at the proposed development site and the depth to rock varies from 0.6m to a maximum of 2.2m BGL at the proposed development (GII, 2023).

A site investigation (S.I) was carried out by Grounds Investigations Ireland Ltd., between December 2022 and February 2023 which included the area of the proposed development. The S.I undertaken:

- 5 No. Trial Pits / Soakaways to determine a soil infiltration value to BRE digest 365;
- 2 Silt trench to investigate existing services;
- 4 No. Window Sample Boreholes to recover soil samples;
- 4. No Dynamic Probes to determine soil strength/density characteristics;
- 5. No Rotary Core Boreholes to a maximum depth of 3.50m BGL.
- 2. No Groundwater Monitoring Wells

Please refer to the standalone Ground Investigation Report (2023) prepared by Ground Investigation Ireland and submitted as part of the application.

9.3.4 Soil Quality and Analysis

The assessment follows a source-pathway-receptor linkage format as outlined in the EPA Guidance on the management of contaminated land (2013). The risk-based approach in this guidance is considered best practice for the assessment and remediation of contaminated land and groundwater at EPA licensed sites. This report used the following documents in the investigation of this site:

- BS5930:2015 British Standard Institution, Code of Practice for Site Investigations.

- BS 10175:2011+A2:2017 British Standard Institution, Code of Practice for potentially Contaminated Sites.

9.3.4.1 Soil Guidelines

For this due diligence, the soil results were compared to the Generic Assessment Criteria (GAC) (The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015) concentrations. There are no legislated threshold values for soils in Ireland. As such soil samples were compared to a Generic Assessment Criteria (GAC) derived to be protective of human health, water bodies (including groundwater) and ecology for a residential end use.

Generic Assessment Criteria in the UK has been derived using the Contaminated Land Exposure Assessment (CLEA) model to be protective of human health for multiple different land uses. LQM (Land Quality Management) and the CIEH (Chartered Institute of Environmental Health) developed a document in July 2009 detailing their own research and derivation of their own 'LQM GACs'. LQM GACs were derived for a total of 82 substances including many organic substances for the standard land uses of residential, commercial/industrial and allotments. This was updated in 2015 following further research and the derived results are now called LQM/CIEH Suitable 4 Use Level (S4UL). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently derived and cautious "trigger values" above which further assessment of the risks or remedial action may be needed. For each contaminant S4Uls have been derived for six land use scenarios based on assessing exposure pathways in each planning scenario. In this instance the commercial scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants. S4Uls have been derived for three SOM contents (1%, 2.5% and 6%) to cover the likely range in soils. A prudent approach has been taken by considering the lower 1% SOM content. At this lowest 1% SOM content lower S4AL "trigger values" are presented, as there is less potential for remediation of contaminants through microorganisms and humic substances associated with SOM.

The UK values do not have any legal standing within the Republic of Ireland and no statutory guidance for assessing the significance of soil contamination currently exists. However, the values do provide a means of placing the data within context when considering magnitude of risk and have been used in that capacity for this assessment.

9.3.4.2 Soil Quality

In line with the use of the site for agriculture, there was no evidence of contamination noted in during site investigation. In total, two soil samples were collected throughout the trial pitting exercise that were within the proposed developments red boundary line.

Soil samples were analysed for the following parameters:

- Diesel Range Organics (DRO);
- Mineral Oil;
- Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG);
- Metals (As, Cd, Cr, Pb, Se, Cu, Ni, and Zn);
- Polychlorinated Biphenyls (PCB);
- Volatile Organic Compounds (VOC);
- Semi Volatile Organic Compounds (SVOC); and

- Waste Acceptance Criteria (WAC) for inert waste landfills in accordance with the 2002 European Landfill Directive (2002/33/EC). This suite of parameters includes the following:
  - Mineral oil;
  - Polycyclic aromatic hydrocarbons (PAHs);
  - Polychlorinated biphenyls (PCBs);
  - BTEX compounds (benzene, toluene, ethylbenzene, and xylenes);
  - and methyl tert-butyl ether (MTBE);
  - Total organic carbon (TOC);
  - Leachable component of a range of organic and inorganic parameters.

The soil quality was compared to GAC derived to be protective of human health and ecology for a residential end use, as detailed in above soil guidelines section above.

Soil sample analysis results are presented in **Appendix 9.2**.

9.3.4.3 Summary of Soil Analysis

Heavy Metals

All heavy metal parameter concentrations recorded in the soil samples are below the most conservative threshold value for the LQM/CIEH for HHRA (Human Health Risk Assessment) Residential Threshold at 1% SOM. See **Appendix 9.2**.

Volatile Organic Compounds (VOCs) & Semi Volatile Organic Compounds (SVOCs)

There were no exceedances recorded when VOC and SVOC concentrations in the soil samples were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM. See **Appendix 9.2**.

Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG)

All TPH CWG parameters recorded were below the laboratory's limit of detection (LOD). As such, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM. Please refer to the standalone Ground Investigation Report (2023) prepared by Ground Investigation Ireland and submitted as part of the application.

Polychlorinated Biphenyls (PCBs)

All parameters recorded were below the laboratory's LOD. As such, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM. Please refer to the standalone Ground Investigation Report (2023) prepared by Ground Investigation Ireland and submitted as part of the application.

Polycyclic Aromatic Hydrocarbons (PAHs)

All parameters recorded were below the LOD. As such, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM. Please refer to the standalone Ground Investigation Report (2023) prepared by Ground Investigation Ireland and submitted as part of the application.

Waste Acceptance Criteria (WAC) Analysis

During the site Investigations carried out by Grounds Investigations Ireland Ltd, seven shallow soil samples were collected from a number of trial pits across the site from natural ground and analysed for their compliance to the criteria set out in the 2002 European Landfill Directive (2003/33/EC) which established criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Two of which were located in the proposed development red boundary line.

All, including those carried out on site of proposed development proved compliant in accordance with Soil Waste Acceptance Criteria (WAC) – Classification for Disposal, the GII Report classifies soil quality as *Inert / non- hazardous.* Therefore, seven of the samples featured would be accepted by an inert landfill (refer to **Appendix 9.2**). The WAC comparison table is also present in **Appendix 9.2**. This Table also explains the different classifications and categories set out by the adopted EU Council Decision 2003/33/EC.

Asbestos

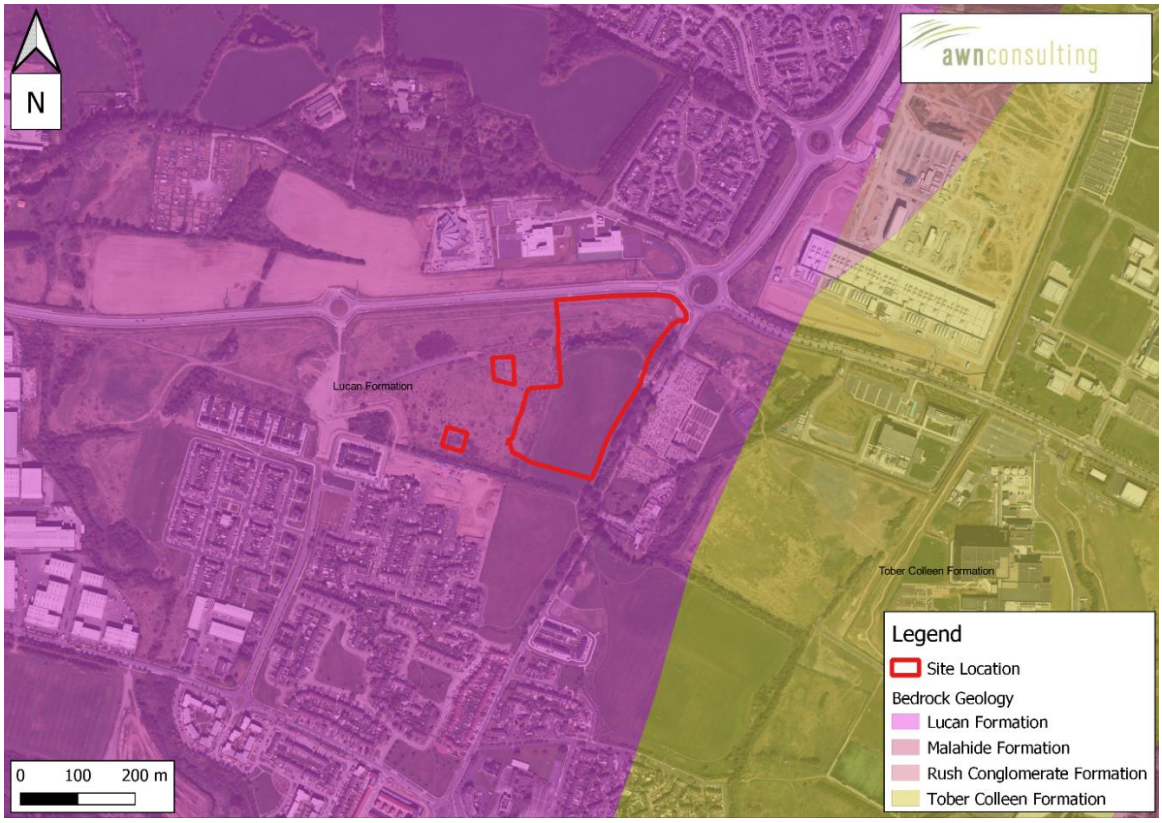
There were no asbestos fibres identified / detected in any of the soil samples which were tested for the presence of asbestos. Please refer to the standalone Ground Investigation Report (2023) prepared by Ground Investigation Ireland and submitted as part of the application.

9.3.5 Regional Geology

Inspection of the available GSI mapping (GSI, 2023) shows that the bedrock geology underlying the site belongs to one formation: LU – Lucan Formation consisting of 'Calp' limestone (i.e., sequences of dark grey massive limestones, shaley limestones, and massive mudstones). The rotary core boreholes recovered Medium strong to Strong dark grey fine grained laminated limestones. This is typical of the Calp Formation. The bedrock geology (100k solid geology; GSI, 2022) of the site is shown on **Figure 9.4** below.

In terms of the structural geology of the area, the GSI database (refer also to **Figure 9.4**) does not show any faults on the site or within the immediate vicinity of the site. A series of right lateral strike slip faults are located approximately 3km from the site, which trend in a NE-SW direction. These displace a series of unbedded limestones and a mixture of sandstones, shales, and limestones.

Figure 9.4 Bedrock Geology Map (Source: www.gsi.ie)



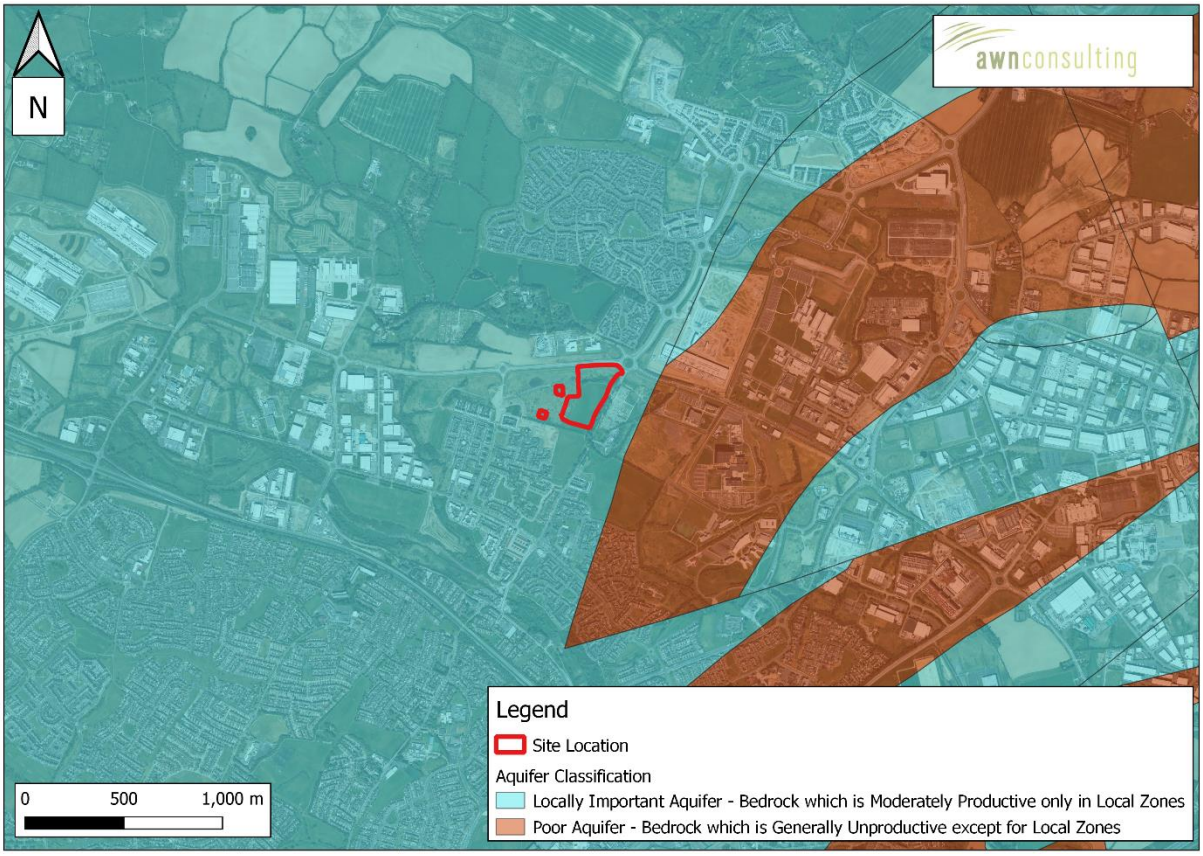
9.3.6 Hydrogeology

9.3.6.1 Description of Water Body

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater throughput (mm^3/d). There are three main classifications: regionally important, locally important, and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

The bedrock aquifer underlying the site according to the GSI (www.gsi.ie/mapping) National Bedrock Aquifer Map is classified as (*Ll*) *Locally Important Aquifer*, i.e., *bedrock aquifer which is moderately productive only in local zones*. Figure 9.5 below presents the current bedrock aquifer map for the area surrounding the site.

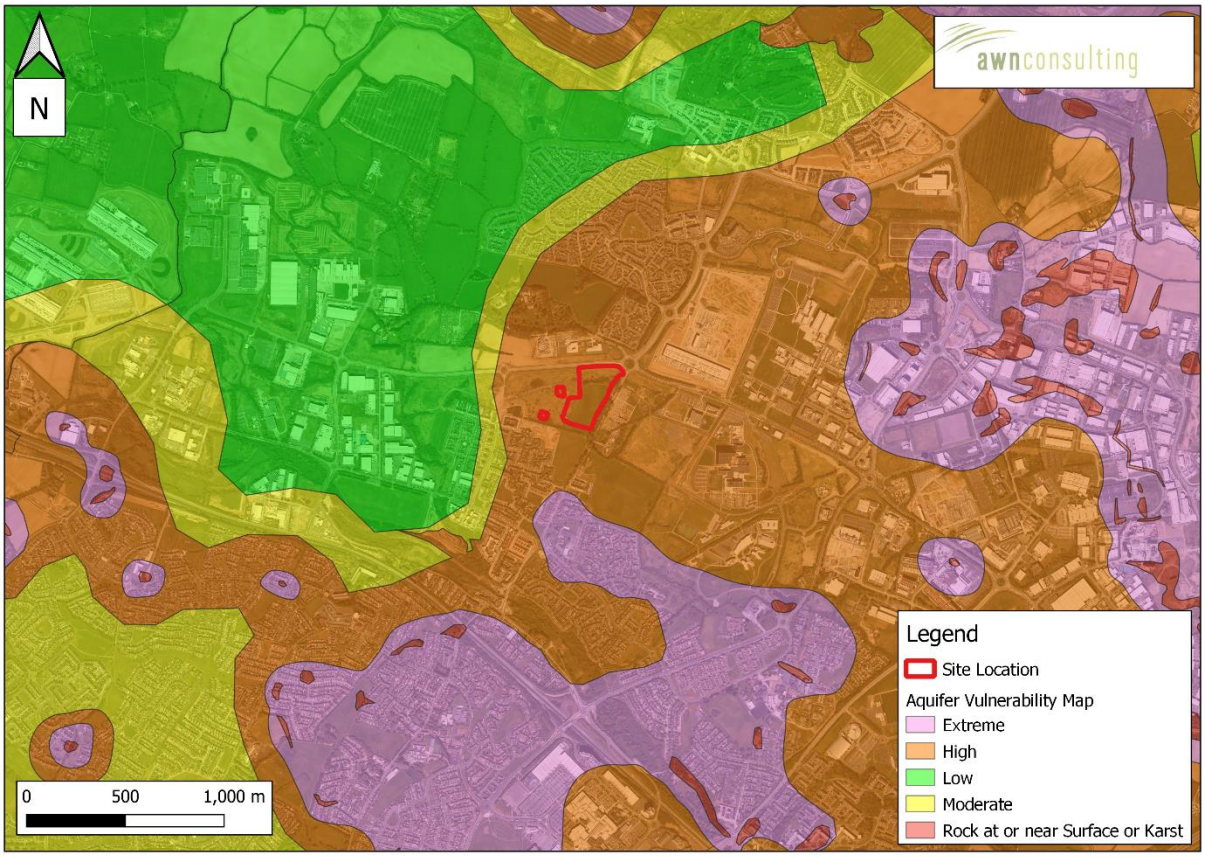
Figure 9.5 Aquifer Classification Map (Source : www.gsi.ie)



Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of/ or of mixtures of peat, sand, gravel, glacial till, clays, or silts).

Groundwater Vulnerability is a term used to represent the natural ground characteristics that determine the ease with which groundwater may be contaminated by human activities. The GSI currently classifies the aquifer vulnerability in the region of the subject site as *High (H)* based on regional data. However, based on the site-specific drilling and an overburden depth of 3m-5m of low permeability soil present (refer **Figure 9.6** below), depth to rock indicates *High – Extreme* Vulnerability.

Figure 9.6 Aquifer Vulnerability Map (Source: www.gsi.ie)



9.3.6.2 Groundwater Wells and Flow Direction

There are no recorded groundwater resource protection zones in the area of the proposed site, i.e., zones surrounding a groundwater abstraction area.

The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. This current index, however, shows a number of groundwater monitoring and abstraction wells within a 3 km radius of the site; the abstraction wells generally supply a mix of use ranging from domestic to public to industrial use. These wells are generally located in the Calp Limestone with recorded yields ranging between ca. 16m^3/d to 115m^3/d.

Figure 9.7 below presents the GSI well search for the area surrounding the site (Note this source does not include all wells) and Table 9.2 below summarises the details of some of the wells present within this search area.

Figure 9.7 GSI Well Search (*GSI, 2023*)

Table 9.2 GSI Well Index Table from well search (GSI, 2022)

GSI NAME	NAME	TYPE	DEPTH (M)	DEPTH TO BEDROCK (M)	EASTING	NORTHING	TOWNLAND	COUNTY	YIELD CLASS
2823NEW033	TW 1	Borehole	150	12	306,460.00	241,460.00	Tyrrelstown	Dublin	Good
2923NEW041	Ladys Well	Spring			306990.00	241010	Tyrrelstown	Dublin	
2823NEW048	DH 3	Borehole	12	2	307210	242210	Tyrrelstown	Dublin	
2823NEW049	DH 4	Borehole	22.2	2	307400	242120	Tyrrelstown	Dublin	
2823NEW054	DH 9	Borehole	23	3	307680	242350	Hollywoodrath	Dublin	
2823NEW059	BH 2	Borehole	6.8	6.8	306830	242290	Tyrrelstown	Dublin	

The primary flow path is within the weathered bedrock and fractures within the limestone. As this is a Locally Important aquifer fracture connectivity is likely to be poor. Based on the topography and drainage pattern groundwater flow will be in a southerly direction towards the Tolka River and likely towards the River Liffey on a more regional scale.

9.3.6.3 Groundwater Quality

The European Communities Directive 2000/60/EC established a framework for community action in the field of water policy (commonly known as the Water Framework Directive [WFD]). The WFD required '*Good Water Status*' for all European water by 2027, to be achieved through a system of river basin management planning and extensive monitoring. 'Good status' means both *'Good Ecological Status'* and *'Good Chemical Status'*.

The Groundwater Body (GWB) underlying the site is the Dublin GWB (EU Groundwater Body Code: IE_EA_G_008). Currently, the EPA (2023) classifies the Dublin GWB as having *'Good Status'*, as per the last WFD cycle (2016-2021). Presently, the groundwater body in the region of the site (Dublin GWB) is classified as being under 'Review' per the WFD Risk Score system in order to determine whether or not the GWB has achieved its objectives and has either no significant trends or improving trends.

During the ground water monitoring site investigation carried out in May 2023, Borehole RC07 was encountered at one location within the proposed development red line, and it was found to be dry. Base of hole at 3.40m BGL.

Hydrogeological Features

According to the GSI Karst database there is no evidence of karstification (bedrock prone to dissolution leading to underground drainage systems such as caves and large crevices) in this area.

TII Methodology

Based on the TII methodology, the criteria for rating site importance of geological and hydrogeological features, the importance of the features at this proposed development site is rated as *Low Importance*. This is based on the assessment that the attribute has a low-quality significance or value on a local scale (refer to **Appendix 9.1**).

9.3.6.4 Areas of Conservation

There are no Special Protection Areas, candidate Special Areas of Conservation or proposed Natural Heritage Areas within or immediately adjacent to the facility. The nearest site designated for nature conservation is the Rye Water Valley/Carton SAC (Site Code 001398), which is located approximately 8.2 km to the south-west and associated with a different catchment. As such, there are no groundwater dependent wetlands within the zone of influence of the proposed development.

9.3.7 Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland) the site location is a Very Low Radon Area where is it estimated that less than 1% of dwellings (About 1 in 20 homes in this area is likely to have high radon levels) will exceed the Reference Level of 200 Bq/m^3. This is the lowest of the five radon categories which are assessed by the EPA.

9.3.8 Geohazards

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage, and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff and leads to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. There have been no recorded landslide events at the site. The GSI landslide database was consulted and the nearest landslide to the Proposed Development was approximately 3.6km to the west, referred to as the M3 J4 Clonee event which occurred on 03rd of February 2014 (GSI_LS16_0042). Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network operated by the Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) which has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland operated by DIAS. The seismic data from the stations comes into DIAS in real-time and is studied for local and regional events. Records since 1980 show that the nearest seismic activity to the proposed location was in the Irish Sea (1.0 – 2.0 Ml magnitude) and ~50 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity to the proposed development site.

There are no active volcanoes in Ireland so there is no risk from volcanic activity.

9.3.9 Land take

There will be a loss of land available for greenfield/agricultural use due to the development. However, the area of development is relatively small in the context of agricultural land available in the overall region. This change of land use has already been established for the permitted zone of residential development.

9.3.10 Conceptual Site Model

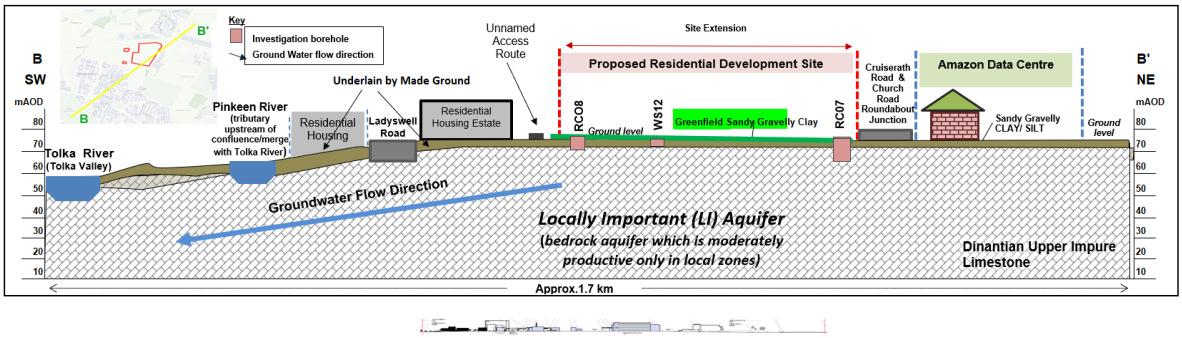
Based on the regional and site-specific information available the type of Geological / Hydrogeological Environment as per the IGI Guidelines is:

Type A – Passive geological/hydrogeological environment.

Figure 9.8 presents the location of representative cross sections through the site to show the local hydrogeology conceptual site model (CSM) which is as follows:

- The site is situated on relatively flat ground within lands zoned for residential development;
- The proposed development site has been greenfield/agricultural use historically. There is no evidence of any historical waste disposal or source of contamination;
- The profile on site is relatively consistent and comprises of one formation: LU – Lucan Formation consisting of 'Calp' limestone (i.e., sequences of dark grey massive limestones, shaley limestones, and massive mudstones). The depth to rock varies from 0.6m to a maximum of 2.2m BGL;
- Review of the geology and hydrogeology in the surrounding region indicates that there are no sensitive receptors such as groundwater-fed wetlands, significant public water supplies/ Group Water Schemes or geological heritage sites within the immediate vicinity which could be impacted by the proposed development;
- The site is not underlain by a Regionally Important aquifer, the site is underlain by the Local Aquifer. Groundwater flow direction is southwards towards the Tolka;
- A graveyard exists along the south eastern boundary.

Figure 9.8 Regional CSM cross section



9.4 Predicted Impacts of the Proposed Development

This section details the potential impacts to land, soil and groundwater associated with the proposed development. As outlined below the activities required for the construction phase of the proposed development represents the greatest risk of potential impact on the geological and hydrogeological environment. These activities primarily pertain to the site preparation, excavation and infilling activities required to facilitate construction of the proposed development.

9.4.1 Do-Nothing Impact

If the proposed development were not to go ahead (i.e., in the Do-Nothing scenario) there would be no excavation or construction or operational impact at this site. There would, therefore, be a **neutral** effect on the environment.

The site is zoned for residential development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal, as described in the following sections.

9.4.2 Construction Phase

The primary impact during construction in relation to land soils and geology are:

- During the construction phase, excavated topsoil and subsoil (c. 9,550 m^3) will be generated from the excavations required to facilitate site levelling and construction of new foundations. It is anticipated that all c. 7,640 m^3 will be reused on site. It is anticipated that c. 1,910 m^3 of excavated material will need to be removed off site. Where material must be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort.
- Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction. Rainfall and wind can also impact on non-vegetated/uncovered areas within the excavation or where soil is stockpiled. This can lead to run-off with high suspended solid content which can impact on water bodies. The potential risk from this indirect impact to water bodies and/or habitats from contaminated water would depend on the magnitude and duration of any water quality impact.
- Due to the lack of previous development at the site and the historical greenfield use at the site, the risk of contaminated soils being present onsite is low. As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if

contaminated water is allowed to percolate to the aquifer. The potential main contaminants include:

- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from on-site toilets and washrooms.

- Accidental discharges can also occur from welfare facilities during construction activities. Wastewater can contain high levels of bacteria, chemicals, and organic matter, which could contaminate nearby water sources if discharged incorrectly. The establishment and use of welfare facilities and connection to the existing combined foul sewer, ensures that there are no potential significant impacts; therefore, no additional mitigation is required.
- In addition to the unintentional spillages of the primary sources of contaminants mentioned above, there is also a risk that rainfall run-off excavation activities becoming contaminated by these sources. If not appropriately mitigated through containment, management, and monitoring, this could result in the mobilisation of these contaminants, leading to more widespread impacts on the surrounding environment.

In the absence of mitigation, the impact on land soils and groundwater during the construction phase is considered to be **negative, imperceptible-not significant,** and **short-term**. With mitigation, the impact will be **neutral, imperceptible,** and **short-term.**

9.4.3 Operational Phase

There will be no direct discharges to the ground or abstractions from the bedrock aquifer during the operation of the development. The potential impacts of the development post development in relation to land soils and environment have been assessed under the following headings:

- Localised and Minor Accidental Emissions to Ground from a car leak/delivery truck;
- Increase in hardstanding area (c.16,828m^2) will result in a localised reduction in recharge to the aquifer. This provides protection to the underlying aquifer but also reduces local recharge in this area of the aquifer. As the area of aquifer is large this reduction in local recharge will have no significant change in the natural hydrogeological regime. The use of permeable pavement in the parking areas will allow some percentage of recharge to the underlying bedrock aquifer.

With or without mitigation, the impact of the proposed development on land soils and groundwater post construction is considered to be **neutral, imperceptible,** and **long-term**.

9.5 Mitigation Measures

This section outlines the measures that will be employed in order to minimise the impact on land, soils, and groundwater of the proposed development.

9.5.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development:

9.5.1.1 Suspended Solids

A quantity of topsoil and subsoil will need to be excavated to facilitate the proposed development. Correct classification and segregation of the excavated material is required to ensure that any

potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In order to manage the potential impact associated with sediment and sediment runoff the following mitigation measures will be implemented during the construction phase.

- During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts;
- Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds);
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only;
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate;
- A stabilised entranceway consisting of an aggregate on a filter cloth base that is located at any entry or exit point of the construction site;
- Aggregate will be established at the site entrance points from the construction site boundary extending for at least 10 m;
- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection;
- Construction materials, including aggregates etc. will be stored a minimum of 20-meter buffer distance from any surface water bodies and surface water drainage points;
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination;
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust;
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations;
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.

9.5.1.2 Sources of Fill and Aggregates

All fill and aggregate for the proposed development will be sourced from reputable suppliers per the project Contract and Procurement Procedures. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development;
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company.

Cement/concrete works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Washouts will only be

allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Uisce Éireann / FCC.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase to prevent any spillages to ground of fuels and other construction chemicals and prevent any spillages resulting to surface water and groundwater systems:

- Designation of bunded refuelling areas on the Site;
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowsers are used, the following measures will be taken:
    - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
    - The pump or valve will be fitted with a lock and will be secured when not in use;
    - All bowsers to carry a spill kit and operatives must have spill response training;
    - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they will be secured and on spill pallets; and
- Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "*Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors*" (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

9.5.2 Operational Phase

9.5.2.1 Land, Soils, Geology, and Hydrogeology

The proposed development design includes hardstand cover across the site and as set out in the EAR (2023) the proposed/existing surface water drainage system for this development has been designed as a sustainable urban drainage system and uses overground detention basins together with a flow control device, green roofs, swales, detention basins, rainwater harvesting and petrol interceptors. Therefore, the risk of accidental discharge has been adequately addressed through design.

9.6 Residual Impacts

9.6.1 Construction Phase

9.6.1.1 Land, soils, Geology, Hydrogeology

The implementation of the mitigation measures outlined in Section 9.5 of this chapter will ensure that targeted rates of impact to land, soils and ground water are achieved at the site of the Proposed Development during construction and operational phases. When mitigation measures are implemented throughout construction the predicted impact on the environment will be **short-term, imperceptible,** and **neutral**. No mitigation other than design measures (interceptors etc.) are proposed for the operational phase. The predicted impact will be **long-term, imperceptible,** and **neutral.**

9.6.1.2 Human Health and Population

The implementation of the mitigation measures outlined in Section 9.5 of this chapter will ensure that the potential impacts on human health and populations during the construction phase are adequately mitigated. The residual effect on surface water quality during the construction phase is considered to be **neutral, imperceptible,** and **short-term**.

9.6.2 Operational

9.6.2.1 Land, soils, Geology, Hydrogeology

The implementation of the mitigation and monitoring measures detailed in Section 9.5, will ensure that the potential impacts on land, soils, geology, hydrogeology once the proposed development is constructed and operational are adequately mitigated. The residual effect on surface water quality during the operational phase is considered to be **neutral, imperceptible,** and **long-term**.

Following the TII criteria (refer to **Appendix 9.1**) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

9.6.2.2 Human Health and Population

The implementation of the mitigation and monitoring measures detailed in Section 9.5 and 9.7, will ensure that the potential impacts on human health and populations once the proposed development is constructed and operational are adequately mitigated. The residual effect on human health and populations during the operational phase is considered to be **neutral, imperceptible,** and **long-term**.

9.6.2.3 Water Framework Directive Status

There is no potential for adverse or minor temporary or localised effects on the Dublin groundwater body as a result of the Proposed Development. Therefore, it has been assessed that it is unlikely that the proposed development will cause any significant deterioration or change on its water body status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the draft third RBMP 2022-2027.

Even in the absence of the mitigation and monitoring measures detailed in Section 9.5 and 9.7, there will be no predicted degradation of the current water body (chemically, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives in the draft third RBMP 2022-2027.

There are appropriately designed mitigation and design measures which will be implemented during the construction phase to protect the hydrogeological environment. There is a potential of accidental discharges during the construction and operational phases, however these are temporary short-lived events that will not impact on the water status of underlying aquifer long-term and as such will not impact on trends in water quality and over all status assessment.

9.7 Monitoring or Reinstatement

The management of land, soils and ground water during the construction phase will be monitored by the Contractor to ensure compliance with above-listed mitigation measures, and relevant waste management legislation and local authority requirements.

9.7.1 Construction Phase

During construction phase the following monitoring measures will be implemented:

- Regular inspection of surface water run-off and sediments controls (e.g., silt traps);
- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off; and
- Regular inspection of construction / mitigation measures (e.g., concrete pouring, refuelling, etc).

9.7.2 Operational Phase

There will be no requirement for groundwater monitoring as there is no likely discharge to ground.

9.8 Interactions

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR. The main interactions of importance to land, soils, geology, and hydrogeology relate to Biodiversity (Chapter 8), Hydrology (Chapter 10), and Air Quality (Chapter 11) as follows.

9.8.1 Biodiversity

The proposed development may have temporary negative impacts on biodiversity at site level, while it will not impose any significant impact on European Designated sites, the proposed development will cause a loss of a proportion of treeline / hedgerow in the northern part of site which will result in impacts on nesting birds and commuting bats.

9.8.2 Hydrology

The Pinkeen River is a tributary of the Tolka river which flows west of the proposed development and does not flow through the site boundary. Therefore, there is no evidence of a source pathway linkage

to the underlying aquifer and no evidence of soil contamination. There is a Spring downgradient of the site, this acts as a receptor.

9.8.3 Air Quality

During construction of the proposed development, there will be a proportion of dust created that will impact air quality.

9.8.4 Traffic and Transportation

Local Traffic and transportation will be implemented by the additional vehicle movements generated by the volume of excavated soil that will have to be transported off site, resulting in an increase of heavy good vehicles (HGVs) during construction. The increase in vehicle movements as a result of excavated soil removal during the construction phase will be temporary in duration. Traffic-related impacts during the construction and operational phases are addressed in Chapter 17 (Traffic & Transportation).

9.9 Cumulative Impacts

As has been identified in the receiving environment section, all cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such, any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

9.9.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase.

This chapter has been prepared with reference to the list of other developments in the vicinity set out in Chapter 21 (Cumulative Impacts). Neither the development proposed nor any other developments will give rise to any significant impacts on land soils and water and there are no predicted cumulative impacts, for example in terms of soil and aquifer degradation, as a result of the proposed development in combination with existing / proposed plans or projects.

In relation to the potential cumulative impact on hydrogeology during the construction phases, the construction works which would have potential cumulative impacts are as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses;
- Stockpiled material will be stored on hardstand away from surface water drains, and gullies will be protected during works to ensure there is no discharge of silt-laden water into the surrounding surface water drainage system;
- Contamination of local water sources from accidental spillage and leakage from construction traffic and construction materials is possible unless project-specific measures are put in place for each development and complied with.

The works contractors for other planned or permitted developments will be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for

receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

A review of the permitted development set out in this EIAR has been undertaken and there are no proposed developments capable of combining with the proposed development and resulting in significant cumulative effects. The implementation of mitigation and monitoring measures detailed in Section 9.5; and 9.7 as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the land, soils, geology, hydrogeological environment during the construction phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible,** and **short-term**.

9.9.2 Operational

In relation to the potential cumulative impact on hydrogeology during the operational phases, the operational activities which would have potential cumulative impacts are as follows:

- Increased hard standing areas will reduce local recharge to ground and increase surface water run-off potential if not limited to the green field run-off rate from the Site. Cumulatively this development and others in the area will result in localised reduced recharge to ground and increase in surface run-off;
- Increased risk of accidental discharge of hydrocarbons from car parking areas, the petrol station, and along roads is possible unless diverted to surface water system with petrol interceptor;
- There will be a small loss of greenfield area locally as part of the proposed Project.

This EIAR also considers the likelihood for cumulative impacts associated with the operational phase of the proposed development and the operational phase of these permitted developments.

The proposed development and the other permitted development listed in Chapter 21 of this EIA Report will result in an increase in hard standing which will result in localised reduced recharge to ground. The aquifer underlying the site is mostly “Locally Important – Bedrock which is Generally Moderately Productive only in Local Zones”. The cumulative impact is considered to be imperceptible. The implementation of SuDs measures on site will mitigate against and reduce the recharge rate to ground.

All developments listed in Chapter 21 of this EIA Report are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (Water Framework Directive and associated legislation) such that they would be required to manage run-off and fuel leakages.

The implementation of mitigation and monitoring measures detailed in Section 9.5 and 9.7 as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the land, soils, geology, hydrogeological environment during the operational phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible,** and **long-term**.

9.10 Difficulties Encountered

There were no significant difficulties encountered in compiling the specified information for this EIA Chapter.

9.11 Conclusion

There will be ***no long-term residual impact*** on land soil geology and hydrogeological receptors, either within or in the vicinity of the proposed development as a result of the proposed development.

9.12 References

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10 Hydrology

10.1 Introduction

This chapter assesses and evaluates the likely significant effects of the development on the hydrological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

This Chapter has been written by Luke Maguire, Environmental Scientist AWN Consulting and Teri Hayes Director of Water AWN Consulting. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

The detailed description of the proposed development is provided in Chapter 5 of this EIAR. The proposed development also includes for amendments to surface water features in the previously permitted Church Fields Housing and Eastern Linear Park development to the west of the proposed development. The main criteria for consideration within this chapter are as follows:

Construction Phase

The activities required for the construction phase of the proposed development represents the greatest risk of potential impact on the hydrological environment. These activities primarily pertain to the site preparation, excavation and infilling activities required to facilitate construction of the proposed development. A Construction Environmental Management Plan (CEMP) (prepared by Brady Shipman Martin, 2023) outlines the mitigation measures to minimise any off site impact during construction.

Operational Phase

The proposed development will result in an increase in hardstand area (16,828m^2) and a resultant increase in run-off for storm water. Therefore, attenuation is to be provided for increase in catchment area to maintain permitted runoff.

In addition to SuDS features, the drainage design includes petrol interceptors on stormwater drainage to mitigate the risk of ground (soil) and water pollution from the development.

The impact of the foul flow based on the entire Church Fields lands (c. 1,000 No. units) on the Uisce Éireann network was assessed following the submission of a pre-connection enquiry form issued to Uisce Éireann. A Confirmation of Feasibility has been issued by Uisce Éireann in April 2023 which confirms capacity for the subject site in the surrounding network. For further information, please refer to Appendix A of the Engineering Assessment Report prepared by Waterman Moylan Consulting Engineers Limited (2023).

10.2 Methodology

10.2.1 Criteria for rating of effects

This chapter evaluates the effects, if any, which the development has had or will have on Hydrology as defined in the Environmental Protection Agency (EPA) '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*' (EPA, 2022) as well as in line with Article 94 and Schedule 6 of the Planning and Development Regulations 2001 (as amended) and Article 5 and Annex IV of the EIA Directive (2011/92/EU, as amended).

The document entitled '*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*' by the Transport Infrastructure Ireland (TII) formerly National Roads Authority (NRA) (TII, 2009) is referenced where the methodology for assessment of impact is appropriate. Furthermore, in line with this TII Guidelines, an assessment of the attribute importance has been undertaken in order to provide a basis for the assessment of impact provided. The attribute importance considers the potential as well as the existing use of the surface water features as a water resource (i.e., water supply, fisheries and other uses) as well as ecological habitat requirements. The TII criteria for rating the hydrological related attributes are presented in Appendix 10.1.

The quality, significance, and duration of the potential impacts, residual effects, and cumulative effects are described using standard EIA descriptive terminology set out in Table 1.5, Chapter 1 of this EIAR.

The principal attributes (and effects) to be assessed include the following:

- Water Framework Directive (WFD) Status and potential for increased risk of deterioration of this status due to the activities of the site;
- Surface watercourses near the site and potential impact on surface water quality arising from proposed development related works including any discharge of surface water run-off;
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and
- Surface water features within the area of the site.

10.2.2 Sources of Information

Desk-based hydrological information in the vicinity of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area;
- River Basin Management Plan for Ireland 2018-2021.
- Draft River Basin Management Plan for Ireland 2022-2027.
- Fingal Development Plan 2023-2029.
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001); and
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Engineering Assessment Report – Application at Church Fields East, Mulhuddart, Dublin 15. Waterman Moylan Consulting Engineers Limited (2023);
- Construction Environmental Management Plan- Church Fields East (Brady Shipman Martin, 2023);
- Ground Investigation Report – Churchfields, (Ground Investigations Ireland "GII", 2023);
- The proposed development design site plans and drawings; and
- Consultation with the project design engineers.

10.2.3 Difficulties in Compiling the Assessment

There were no significant difficulties encountered in compiling the specified information for this EIA chapter.

10.3 Baseline Environment

The proposed development currently comprises a greenfield site of c.5.52 hectares which is located at Church Fields East, Mulhuddart, Dublin 15. The site topography is characterised by relatively level terrain with minor localized undulations a slight gradient or gradual, gentle slope (fall) in elevation of c. 1:54 (ground level) from north to south. The elevation varies / ranges in level from a maximum of approximately 87m OD to a minimum of 80m OD in the north-east and south-west of the site, respectively.

The site is within the jurisdiction of Fingal County Council. The subject site is characterised by a historical / previous agricultural function in relation to land use and remains unoccupied by building structures. The site presents predominantly undeveloped soft grassland (greenfield) and partially comprises the remains of a decommissioned / unestablished road which previously traversed the site's east and west boundaries prior to the year 2004 (refer to Chapter 9 for further detail / information). The Church Fields Link Road and cycle network (permitted under FCC Reg Ref: PARTXI/012/21) services the entire Church Fields lands by merging / joining Ladyswell Road to the south and Damastown Avenue to the north. According to local authority records, the site is zoned as 'RS' indicating that the site classifies as appropriate for the provision of residential development and to protect and improve residential amenities as outlined in the 'Fingal Development Plan 2023-2029'.

The surrounding environment can be described as a mixture of agricultural (greenfield), industrial, residential, commercial, and recreational land use. The development site is bounded by Damastown Avenue to the north; by a mature tree stand aligning the adjacent Church Road to the east; by unoccupied land previously permitted residential development at Church Fields (Planning Reg. Ref.: PARTXI/012/21). The site is bounded to the south by a permitted linear park (Eastern Linear Park Planning Reg. Ref.: PARTXI/012/21), in the townland of Tyrrelstown, Dublin 15. The site is located west of protected structure RPS No. 670 Mulhuddart Church (in ruins) & Graveyard, which is situated east of Church Road. The land directly / immediately north-east of the site is occupied by the adjacent Damastown roundabout junction which gives access to the R121 Regional Carriageway route, while further north-east lies the neighbouring Amazon Data Centre property.

10.3.1 Hydrology

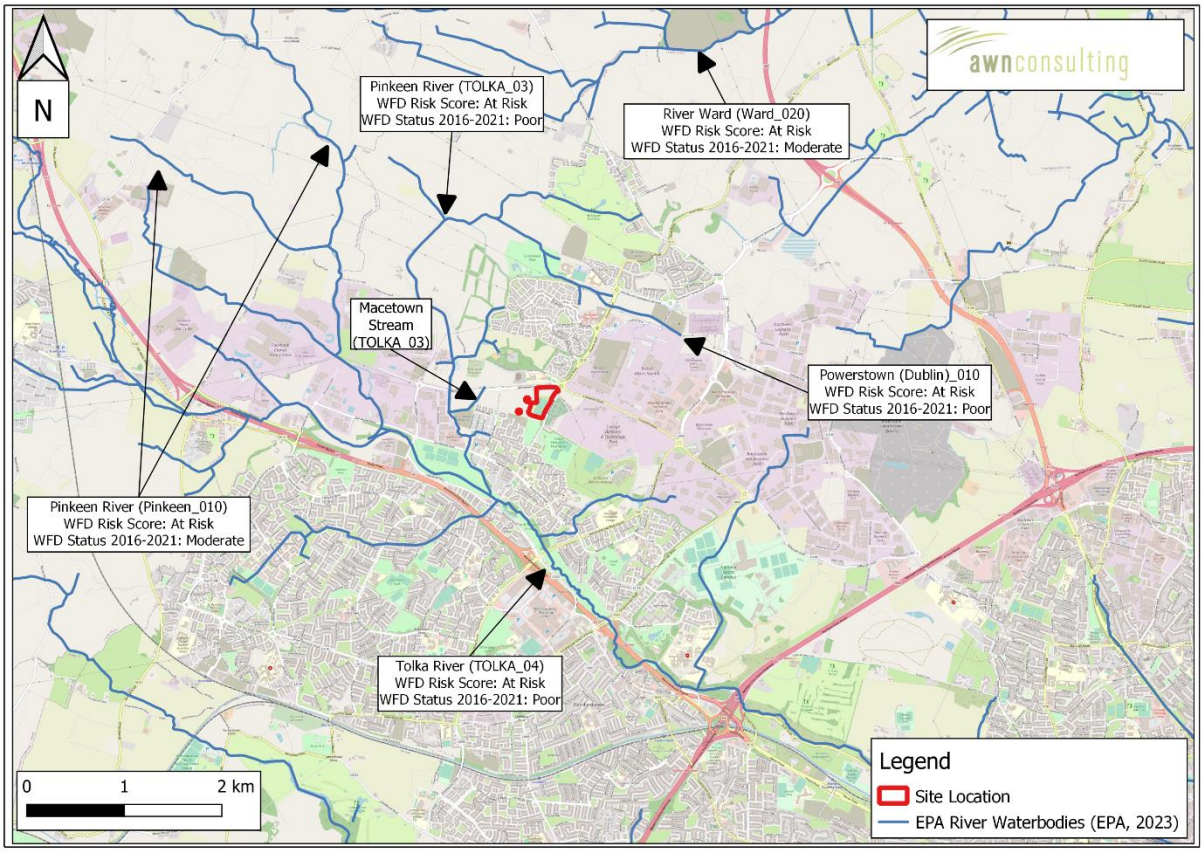
There are no surface watercourses or streams on the site itself or along its boundaries. The most significant drainage system in the vicinity is the River Tolka and its adjoining tributaries (Pinkeen River), which are located approximately 0.82 km south-west of the site at the point of closest proximity.

The proposed development site is located within the former Eastern River Basin District (ERBD) (now the Irish River Basin District), as defined under the Directive 2000/60/EC of the European Parliament commonly known as the Water Framework Directive (WFD). The WFD, establishes a framework for community action in the field of water policy. According to the EPA mapping database, the proposed development site is situated in Hydrometric Area No. 09 of the Irish River Network and lies within the extent of the Liffey and Dublin Bay Catchment (Catchment ID: 09) and the Tolka Sub-Catchment Tolka_SC_010, 09_10 (EPA, 2023).

According to the EPA river network, the Tolka River and its tributary represents the largest drainage network in the vicinity of the site. The Macetown South Stream (IE_EA_09T010800) is the surface waterbody in closest proximity, which is located circa 570 m west of the site. The East Pinkeen river runs approximately 820m to the west. The lands are drained by the East Pinkeen River. The Macetown stream flows in a south-westerly direction prior to merging with the Pinkeen River. The Pinkeen River flows south-east along the boundary of Church Fields west of the Churchfields lands. Further downstream, the Pinkeen River discharges to the Tolka River (confluence point) at Tolka Valley park located c. 0.9 km south-west of the site at the point of closest proximity. Tolka River subsequently flows in a general south-east direction before it ultimately discharges / outfalls to Dublin Bay (Irish Sea) via the Tolka Estuary, approximately 14.8 km to the east (linear distance) of the proposed development site. The Tolka Estuary (IE_EA_090_0200) is classified as a Nutrient Sensitive Area under the Urban Wastewater Treatment Directive.

As the Pinkeen River is a tributary of the Tolka River it is in direct hydraulic connection to a number of National, European protected, and Natura 2000 conservation areas associated with Dublin Bay (proposed National Heritage Areas pNHA/Special Areas of Conservation SAC/Special Protection Areas SPA). There would be an indirect hydrological discharge linkage / connection to Dublin Bay waterbody from the proposed development site through stormwater and foul water site drainage, albeit at a significant distance (c. 14.8 km approximate linear distance) with a large dilution factor both in the river catchment and in Dublin Bay. Refer to **Figure 10.1** below for further details.

Figure 10.1 Site Location and Surrounding River Waterbodies (Source: EPA, 2023)



There are no watercourses within the proposed development site. Catchment Flood Risk and Assessment Management (CFRAM) studies and Office of Public Works (OPW) flood history maps do not indicate any historic flooding on the site or its immediate vicinity.

10.3.2 Surface Water Quality

The WFD requires 'Good Water Status' for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means / indicates both 'Good Ecological Status' and 'Good Chemical Status'. In 2009 the first River Basin Management Plan (RBMP) 2009-2015 was published. The second cycle river basin management plan was carried out between 2018-2021 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD). The third cycle (2022-2027) is currently being undertaken.

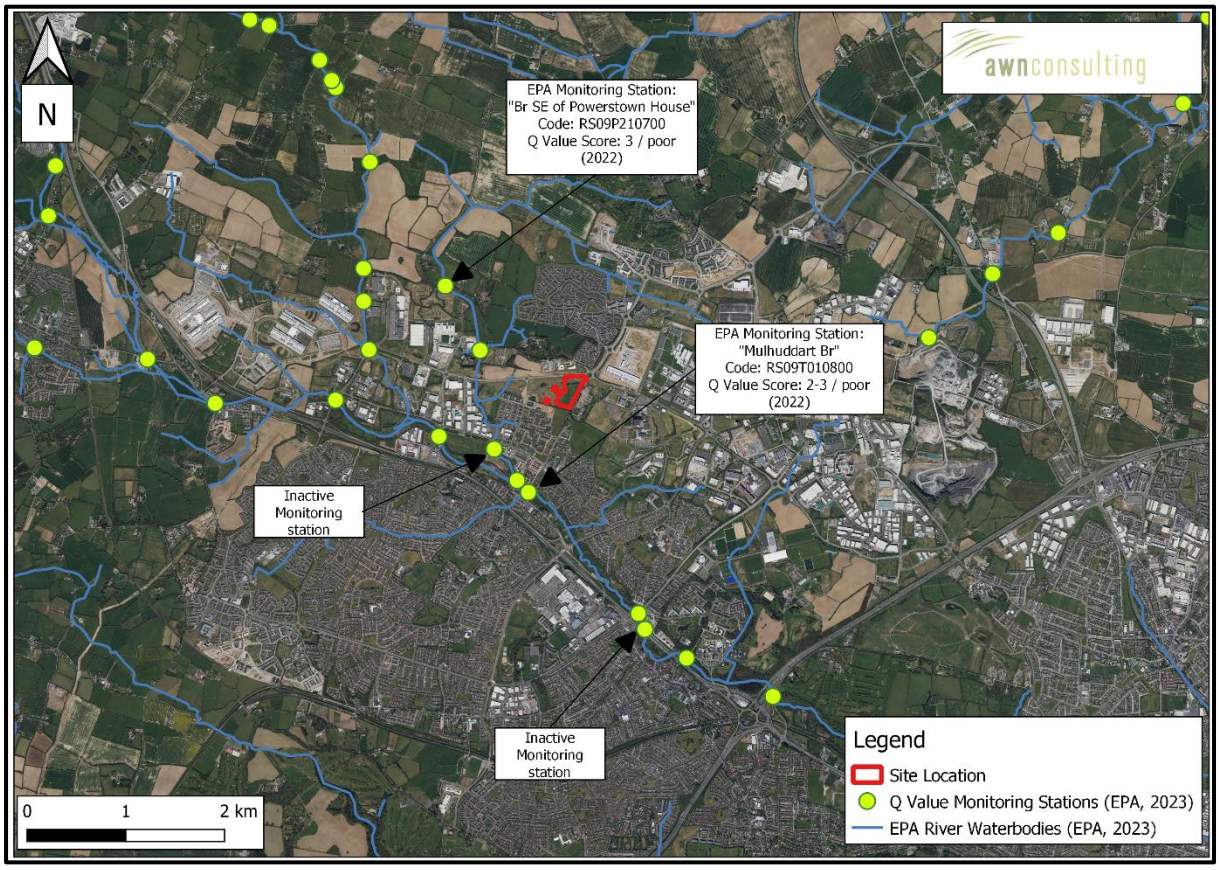
Surface water quality is monitored periodically by the EPA at various regional locations along with principal and other smaller watercourses. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

In relation to the subject site, the nearest active EPA monitoring station located in the vicinity of the site is:

- 'Mulhuddart Br' monitoring station (EPA Code: RS09T010800), is located in the Tolka_040 surface / river waterbody in Mulhuddart c. 1.1 km to the south (downstream/downcourse) of the proposed development site. The most recent status recorded by the EPA (2022) is classified as *Q2-3 Poor (Moderately polluted)*.
- 'Br SE of Powerstown House' monitoring station (EPA Code: RS09P210700), is located in the Pinkeen (Tolka_030) surface / river waterbody in Mulhuddart c. 2.1 km to the north-west (Upstream) of the proposed development site. The most recent status recorded by the EPA (2022) is classified as *Q3 Poor (Moderately polluted)*.

Refer to **Figure 10.2** below for locations of these EPA quality monitoring points in the context of the site.

Figure 10.2 EPA Surface Water Quality Stations, (Source: EPA, 2023).



As previously mentioned, the Tolka River belongs to the Tolka_040 WFD surface waterbody (European code: IE_EA_09T011000). According to the most recent published status (www.epa.ie – River Waterbody WFD Status 2016-2021), the TOLKA_04 and its directly upstream tributary, the Pinkeen River (TOLKA_03) are both currently classified as *'Poor'* and its WFD risk score is '*At risk of not achieving good status*'. The main pressures identified on the waterbody are associated with the presently 'poor' ecological status or potential. The biological status has been recorded as '*Poor*', which is specifically related and attributable to poor invertebrate status or potential.

10.3.3 Bathing Waters and Recreational Waterbodies

A review of Environmental Sensitivity Mapping online maps that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has shown that there are no Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA, located downstream in the Tolka River.

10.3.4 Existing and Proposed Utilities and Drainage Infrastructure

Foul Wastewater

An existing Ø900mm foul water trunk sewer is located along the western boundary, approximately 800m from the subject site. The Ø900mm trunk sewer conveys the foul water in a southerly direction and ultimately discharges to Ringsend WWTP.

It is proposed that the **foul water** from the Church Fields development will drain by gravity in a southwestern direction and discharge into the existing Ø900mm foul water trunk sewer located along the western boundary via a single outfall.

The Ringsend wastewater treatment plant (WWTP) is required to operate under an EPA licence (D0034-01) and meet environmental legislative requirements as set out in such licence. It is noted that a planning permission for a new upgrade to this facility was received in 2019 and is currently in the process of construction/ implementation. The upgrade works commenced in 2018 and are expected to be fully completed by 2025. When all the proposed works are complete in 2025, the Ringsend Wastewater Treatment Plant will be able to treat wastewater for up to 2.4 million population equivalent while meeting the required standards.[17]

The 2019 planning permission facilitated upgrading works to meet nitrogen and phosphorus standards set out in the licence, which are temporarily exceeded currently. Works on the first of four contracts to retrofit the existing treatment tanks with aerobic granular sludge technology commenced in November 2020 and was completed in December 2021. In September 2021, the second contract was awarded, and its construction works commenced in November 2021 and is expected to take approximately 2 years to complete. The upgrade works will result in treatment of sewage to a higher quality than current, thereby ensuring effluent discharge to Dublin Bay will comply with the Urban Wastewater Treatment Directive for a population equivalent of 2.1 million by Q4 2023. Refer to the Engineering Assessment Report, prepared by Waterman & Moylan Engineering Limited (2023) included with this Application for the foul water arrangement.

Potable Water Supply

Uisce Éireann records show an existing water pipeline with a diameter of 300 mm that traverses the subject site, running from the south-west side of the site towards the north-east side. A new watermain connection is not foreseen for the proposed development. However, Uisce Éireann have granted a diversion application for this watermain (reference DIV22229). The new route for the water pipeline diversion will start from Damastown Avenue on the north side of the site and then southwards along the new Church Fields link road. It is proposed that development site will be connected to the watermain network that is granted for Church Fields Housing and Eastern Linear Park Development (Permitted under FCC Ref.: Part XI/012/21).

It is proposed to serve the proposed development from the existing site watermain which shall be diverted (previously granted by Uisce Éireann) whereby the new route for the water pipeline diversion will start from Damastown Avenue on the north side of the site and then southwards along the new Church Fields link road. It is proposed that development site will be connected to the watermain network that is granted for Church Fields Housing and Eastern Linear Park Development (Permitted under FCC Ref.: PARTXI/012/21). The average daily demand from the public supply for the development is estimated at 87.9 m^3 /day. (Refer to the Engineering Assessment Report, prepared by Waterman & Moylan Engineering Limited (2023) included with this Application for the potable water arrangement). A Confirmation of Feasibility has been issued by Uisce Éireann on the 18th of April 2023 which confirms capacity for the subject site in the surrounding network.

An estimate of water demand from the public water supply system for the proposed site has been based on the development of 217 units, with an average occupancy of 2.7 persons (in compliance with Irish Water - Code of Practice for Water Infrastructure). The average daily demand from the public supply for the development is estimated at 87.9 m^3 /day. Refer to the Engineering Assessment Report,

[17] https://www.water.ie/projects/local-projects/ringsend/

prepared by Waterman & Moylan Engineering Limited (2023) included with this Application for the potable water arrangement.

Stormwater Drainage

The subject site is currently a greenfield site, previously used for agricultural purposes. There is no existing surface water drainage network adjacent to or on-site. The site comprises grassland partially bounded by hedgerows, and generally slopes from north to south (as previously stated). Surface water, rainfall, is generally percolated through the site via grass and soil.

The nearest existing surface water drainage comprises a Ø225mm diameter surface water sewer used to discharge surface water from the Avondale Park development to a dry ditch via a headwall at a rate of 4.38 l/s, located adjacent the southwestern boundary of Church Fields lands, circa 0.8 km west of the subject site. The dry ditch continues further southwest and ultimately discharges to River Pinkeen. No diversion is required.

For the proposed stormwater / surface water drainage design please refer to the below section 10.3.8.2 of this report.

The surface water is proposed to outfall and flow through 3 No. detention basins, located in the south-western corner of the overall Church Fields Site Strategic development. It will be constructed as part of the roadworks contract, with an outfall (at an overall allowable outfall rate of 35.01 l/s) into the dry ditch to the west of the Church Fields site which ultimately traverses to the Pinkeen River. The outfall from the subject site is calculated to be 16.8 l/s and will be achieved by means of a Hydro-Brake.

10.3.5 Site Specific Flood Risk Assessment

A Site Specific Flood Risk Assessment (FRA) was carried out Waterman Moylan Consulting Engineers Ltd in 2023 (and submitted as part of the planning application) for the proposed development. The proposed development site is located entirely within Flood Zone C i.e., the probability of flooding is low (less than 0.1% AEP or in 1 in 1000 year) for Fluvial and Coastal flooding.

OPW National Flood Hazard Mapping also reports recurring flood events at the confluence of the Tolka River and the East Pinkeen River. OSI Historical Mapping also identifies an area “liable to flooding” at the confluence of the two watercourses. The confluence of the two watercourses is located at approximately 52mOD, which is approximately 27m lower than the lowest ground level on the site, therefore the flood risk to the Church Fields lands as a result of this area prone to recurring flooding is considered low.

According to the SSFRA conducted by Waterman Moylan (2023) there is no risk anticipated for the proposed development regarding fluvial flooding.

No residual risk is foreseen as the development is located outside any flooding zones associated with future scenarios. The development includes the implementation of SUDS and an attenuation system.

A review of the pluvial OPW Preliminary Flood Risk Assessment (PFRA) mapping data there are no previous flood events recorded within the proposed development site. The OPW Historical records show that there is no evidence of flooding at the site. The desktop review shows the proposed development site is not at risk from coastal, pluvial, fluvial or groundwater flooding. Therefore, the proposed development is located within Flood Zone C. The type of development is classed as a *‘Less Vulnerable Development’*. Based on the 2009 Guidelines, it is concluded that this type of development is deemed *appropriate* for this flood zonation.

10.3.6 Areas of Conservation

According to the NPWS (2023) on-line database there are no special protected areas (SPA) or special areas of conservation (SAC) on or within the boundary of the proposed development site. The lands in which the development is located have no formal designations. The site of the proposed development is not under any designation for nature conservation. There are no European sites in the immediate vicinity. The nearest such site is the Rye Water Valley / Carton SAC, c. 8.2km south-west – to which there is no potential impact pathway. Note that the listed distances are linear (i.e. 'as the crow flies').

The nearest national designated land to the site the Royal Canal pNHA (Site Code: 002104) and Liffey Valley (Site Code: 000128) pNHA at c. 3.5 km and 5.0 km to the south and south-west of the southern boundary of the subject site, respectively. As the canal is a contained feature (fully lined) there is no potential for a source pathway linkage.

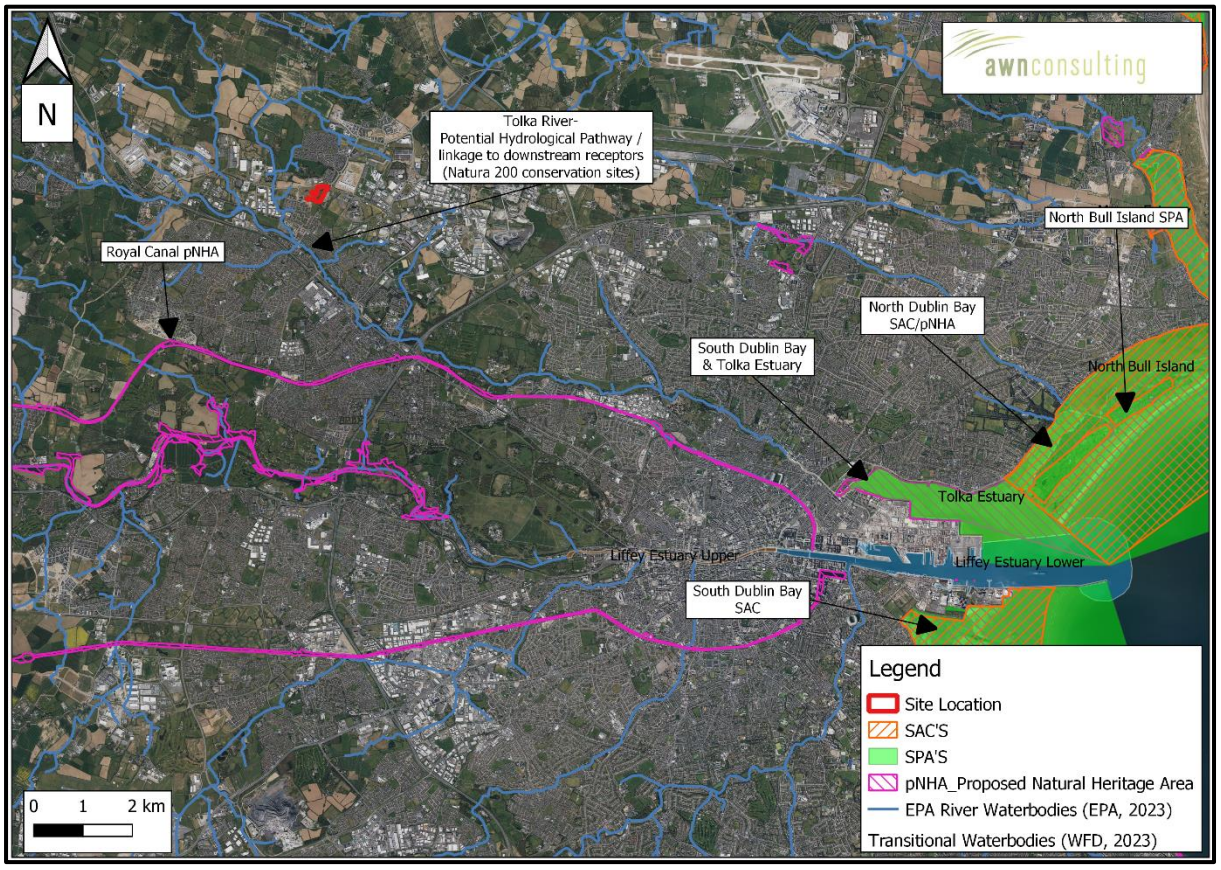
According to the NPWS (2023) online database, the following area of conservations are in hydraulic connection to the Pinkeen River and Tolka River:

- South Dublin Bay SAC (IE000210) c. 14.5 km to the south-east of the site;
- North Dublin Bay SAC (IE000206) c. 15.0 km to the south-east of the site;
- South Dublin Bay and River Tolka SPA (IE004024) c. 14.5 km to the south-east of the site;
- North Bull Island SPA (IE004006) c. 12.2 km to the east of the site;
- North Dublin Bay pNHA c. 12.2 km to the south-east of the site;
- South Dublin Bay pNHA c. 14.5 km to the south-east of the site.

There would be an indirect linkage via stormwater sewer discharge to the Pinkeen River and subsequently the Tolka River and Dublin Bay waterbody from the proposed development site through the stormwater and foul water site drainage (following treatment of foul waste arising at the site at Ringsend Wastewater Treatment Plant (D0034-01). Based on hazard loading, length of distance of pathway (>12km) within the Tolka catchment for surface water run-off and resultant dilution in the Tolka and Dublin Bay there is no potential for any impact on receiving water quality at Natura sites.

Figure 10.3 below presents the location of these protected areas in the context of the proposed development site.

Figure 10.3 Natura 2000 conservation areas in the context of the subject site, (Source: EPA, 2023).



10.3.7 10.3.7 Rating of Importance of Hydrological Attributes

Based on the TII methodology (2009) (See **Appendix 10.1**) the importance of the hydrological features at this site is rated as '*medium importance'* based on the assessment that the attribute has a medium quality significance or value on a local scale, due to the Biotic Index which determines the quality class for the subject site, provides a Class C / Poor (Q3) classification.

10.4 Predicted Impacts of the Proposed Development

10.4.1 Do-nothing Impact

If the proposed development were not to go ahead (i.e., in the Do-Nothing scenario) there would be no excavation or construction or operational impact at this site. There would, therefore, be a neutral effect on the environment. The site is zoned for residential development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal, as described in the following sections.

10.4.2 Construction Phase

10.4.2.1 Potential Impacts on Surface Water Quality, Surface Water Flow and Quantity

There is no natural surface water pathway off site during construction as there is no natural drainage feature on the site. All rainwater run-off will be to ground until the new drainage infrastructure is in place to connect to off-site sewer and ultimately the Tolka catchment. Welfare facilities for domestic wastewater will be provided for the contractors on site during the construction works. These facilities will be connected to the proposed foul drainage system on site or portable sanitary facilities will be provided with waste collected and disposed of appropriately. If connected to the municipal foul sewer there is an indirect connection to Dublin Bay.

During construction of the development, the potential of contamination is associated with the following sources:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

In the absence of mitigation, rainfall run-off during the construction phase may contain increased silt levels or otherwise become polluted from construction activities. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which may in turn impact on local infiltration capacity, or downstream infrastructure or watercourses. Concreting operations pose a potential risk of discharging concrete materials into exposed surfaces and percolate to the underlying groundwater. Concrete, especially the cement component, has a high alkalinity level. There is also the potential risk of unintentional discharge of stored materials like fuels, oils, and paints, which could have negative impacts on surface waters on-site and downstream from the site. It is necessary for the mitigation measures outlined in the CEMP to be implemented to reduce and prevent accidental discharges from occurring during construction, including the implementation of effective containment and monitoring procedures.

Accidental spillages, leaks or discharges can also occur from welfare facilities during construction activities. Ultimately, there would be an indirect discharge to Tolka catchment and Dublin Bay waterbody from the proposed development site if the stormwater and foul water site drainage respectively are connected to municipal sewers. The significant transport distance would result in significant dilution and attenuation within the Tolka Catchment and Dublin Bay.

The Ringsend WwTP operates under licence from the EPA (Licence no. D0034-01) and received planning permission (ABP Reg. Ref.: 301798) in 2019 for upgrade works, which are expected to be completed within five years. This will increase the plant capacity from 1.65m PE (population equivalent) to 2.4m PE. Regardless of the status of the WwTP upgrade works, the peak discharge from the proposed development is not significant in the context of the existing capacity available at Ringsend. Though the WwTP is currently over capacity (the plant is currently accommodating 1.9m PE), recent water quality assessment undertaken in Dublin Bay (published by the EPA) confirms that Dublin Bay is classified as

"*unpolluted*", indicating that the over-capacity issues at Ringsend are not having any impacts on water quality in Dublin Bay. Regardless of the foregoing, the loading from the proposed development (peak foul flow- 6.713l/s) is inconsequential in the context of the WwTP. Therefore, there is adequate capacity in the public foul sewer available to cater for the proposed development.

In the absence of mitigation measures the potential impacts during the construction phase on surface water quality are **negative**, **not significant** and **short term**.

10.4.2.2 Potential Impacts on Human Health and Population

A reduction in water quality via unmitigated pollutants entering the Pinkeen River and Tolka River has the potential to lead to negative impacts on human health and populations if there is an indirect connection through the stormwater sewer. However, it is noted that there are no recorded Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA, located downstream in the Pinkeen River, Tolka River and Tolka Estuary.

In the absence of mitigation measures the potential impacts during the construction phase on human health and populations due to changes to the hydrological environment are **negative**, **imperceptible** and **short term**.

10.4.3 Operational Phase

10.4.3.1 Potential Impacts on Surface Water Quality

Surface Water Drainage

Surface water runoff from roads, car parking, and hardstanding areas, can potentially contain elevated

The proposed development incorporates a sustainable drainage system that is to be integrated with the developments landscaping features and comprises a combination of multiple measures in relation to flow control, interception storage, attenuation storage and catchment conveyance features. In addition, interceptors are included within the network to treat any localised spill prior to discharge off site.

The proposed increase in hardstanding area (c. 16,828m^2) will result in a localised reduction in recharge to the aquifer and has the potential to resulting in increase in run-off from the site if not adequately mitigated within design. The surface water drainage from the proposed development site has been designed by Waterman Moylan Consulting Engineers Ltd (2023) to ensure that there is no increase in flow rates and volumes, from the development site, being discharged to the receiving infrastructure and waterbodies; thus, causing no adverse impact on adjoining and other downstream properties.

The discharge rates are to be restricted to a greenfield runoff equivalent of the Qbar runoff rate of 3.70 l/s as agreed with Fingal County Council's drainage department in discussions as part of finalising the overall site strategy for the Church Fields lands. Surface water runoff shall be restricted via a Hydro-Brake, or similar approved, installed at the outfall manhole of the surface water catchment with excess stormwater attenuated within the development site. It is proposed to install a 750mm diameter pipe which will serve the development, in addition to the road upgrade. The surface water is proposed to outfall and flow through 3 No. detention basins, located in the south-western corner of the overall Church Fields Site Strategic development. It will be constructed as part of the roadworks contract, with an outfall into the dry ditch to the west of the Church Fields site which ultimately traverses to the Pinkeen River.

The surface water drainage design infers to attenuate the surface water run off for the catchment in the open space at the centre of the subject site. It is not possible to attenuate the full area within the open space, given the topography of the site. The western boundary of the site is due to connect into the surface water network for Church Fields Housing and Eastern Linear Park Development (Permitted under FCC Ref.: Part XI/012/21).

With reference to Flood Risk Assessment the proposed buildings for this development are located within Flood Zone C. There are no surface water abstractions proposed, therefore no potential impacts on the quantity of surface water.

With design measures in place, the impact on surface water flow and quality are **neutral, imperceptible, long-term**.

Foul Wastewater Drainage

As described, it is proposed that foul water drainage from the new residential development shall ultimately discharges to Ringsend WWTP. There is an indirect hydrological connection to the European sites associated with Dublin Bay, via foul wastewater arising at the site that will discharge to Ringsend WWTP (D0034-01).

With regard to the Ringsend WWTP, upgrade works commenced in 2018 and are expected to be fully completed by 2025. The upgrade works will result in treatment of sewage to a higher quality than current, thereby ensuring effluent discharge to Dublin Bay will comply with the Urban Wastewater Treatment Directive for a population equivalent of 2.1 million by Q4 2023. The project is being progressed in stages to ensure that the plant continues to treat wastewater to the current treatment levels throughout the delivery of the upgrade.

On the basis of a grant of planning the estimated completion of Phase 1 is Q2 2026; and the estimated completion of Phase 2 is Q1 2028. However, these are likely to be best case scenarios it is likely that the Ringsend WWTP will be upgraded by the time the connection to the foul sewer is made.

However, it is worth noting that even without treatment at the Ringsend WWTP, the peak effluent discharge, would not have a measurable impact on the overall water quality within Dublin Bay or the Natura 2000 sites located therein, and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive). In addition, as the proposed development will not contribute any additional stormwater drainage to the WWTP, the development will therefore have no measurable impact on the water quality in any overflow situation from Ringsend to South Dublin Bay.

The potential impacts on Natura 2000 sites are further explained in Chapter 8 (Biodiversity) and in the separate AA Screening with the application.

On the basis of the design characteristics of the proposed development, and connection with Uisce Éireann to Ringsend WWTP, there are **neutral, imperceptible, long-term** in respect of wastewater loading.

10.5 Mitigation Measures

The design has taken account of the potential impacts of the development on the hydrological environment local to the area where construction is taking place and containment of contaminant

sources during operation. Measures have been incorporated in the design to mitigate the potential effects on the surrounding water bodies.

10.5.1 Construction Phase

The CEMP and this EIAR contains best practice measures and protocols to be implemented during the construction phase of the proposed development to avoid / minimise environmental impacts. This outlines and explains the construction techniques and methodologies which will be implemented during construction of the proposed development.

Construction works and the proposed mitigation measures are informed by best practice guidance from Inland Fisheries Ireland on the prevention of pollution during development projects including but not limited to:

- Construction Industry Research and Information Association (CIRIA), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016);
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (4th edition), (C741); and
- Enterprise Ireland Best Practice Guide, Oil Storage Guidelines (BPGCS005).

The CEMP will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

The CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the CEMP will be employed on site during the construction phase. All mitigation measures outlined here, and within the CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

10.5.1.1 Suspended solids

As there is potential for run-off to indirectly discharge to a watercourse (Pinkeen River) in the vicinity of the site and in order to manage the potential impact associated with sediment and sediment runoff the following mitigation measures will be implemented during the construction phase.

- During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts.
- Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal.
- Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds).
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate.

- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection.
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.
- Any surface water run-off collecting in excavations will likely contain a high sediment load. This will not be allowed to directly discharge directly to the stormwater sewer, Pinkeen River.
- All manholes will be watertight to prevent groundwater ingress into the foul drainage system. Construction details for the proposed drainage systems are included in the accompanying planning submission drawings.
- The outfall pipe from the development is a Ø300mm pipe laid at a minimum gradient of 1:200 which has sufficient capacity to serve all of the future development on the Church Fields lands, and outfall into the existing 900mm diameter infrastructure located approximately 800m to the west of the site. Therefore, there is adequate capacity in the public foul sewer available to cater for the proposed development. The proposed foul network has been designed with Causeway Flow software and will discharge via gravity. Please see Appendix B for details of the foul water design calculations.

In addition to the measures above, all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be established prior to the commencement of the initial infrastructure construction works to collect and discharge any treated construction water during construction.

10.5.1.2 Cement/concrete works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Uisce Éireann / FCC.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

10.5.1.3 Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to surface water and groundwater systems:

- Designation of bunded refuelling areas on the Site;
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowsers are used, the following measures will be taken:
  - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
  - The pump or valve will be fitted with a lock and will be secured when not in use;
  - All bowsers to carry a spill kit and operatives must have spill response training;
  - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they will be secured and on spill pallets; and Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "*Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors*" (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

10.5.1.4 Rainwater Run-off

All storm water on site will eventually flow to 3 No. detention basins, located in the south-western corner of the overall Church Fields Site Strategic development.

Rainfall at the construction site will be managed and controlled for the duration of the construction works until the permanently intercepted and attenuated surface water drainage system of the proposed site is complete. In the meantime, rainwater will continue to discharge to ground as current.

Spill containment measures will be in place to manage any accidental releases to ground. Silt Remediation Treatment System including a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds) to manage silty run-off.

10.5.1.5 Wastewater Management

Foul wastewater discharge from the site will be managed and controlled for the duration of the construction works.

Prior to connection to sewer, site welfare facilities will be established to provide sanitary facilities for construction workers on site. The main contractor will ensure that sufficient facilities are available at all times to accommodate the number of employees on site and are disposed of by a licenced contractor.

10.5.1.6 Surface Water Flow and Quantity

During construction a site drainage and protection system will be built to reduce the flow of run-off from the site, prevent soil erosion, and protect water quality in the Pinkeen River. Temporary excavated channels, bunds, or ridges or a combination of the three, may be constructed to divert sediment-laden water to an appropriate sediment retention structure. These will be installed to provide permanent diversion of clean stormwater away from erosion exposed soil areas, or to provide a barrier between exposed areas and unexposed areas of the construction site. Runoff diversion channels/bunds need regular maintenance to keep functioning throughout their life.

Silt fences will be installed on the site where construction is proposed to detain flows from runoff so that deposition of transported sediment can occur through settlement. Inspection and maintenance of the silt fences during construction phase is crucial to ensuring that they work as intended. They will remain in place throughout the entire construction phase.

It is envisaged that a number of geotextile lined settling tank / basins (e.g. Silt buster) and/or silt fences will be installed to ensure silts do not flow off site during the construction stage. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed. All inlets to the settling basins will be 'riprapped' to prevent scour and erosion in the vicinity of the inlet.

Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be established prior to the commencement of the initial infrastructure construction works to collect and discharge any treated construction water during construction.

10.5.2 Operational Phase

10.5.2.1 Surface Water Quality

The design has taken account of the potential impacts of the development on surface water quality; measures have been incorporated in the design to mitigate these potential impacts.

The proposed development stormwater drainage network design includes sustainable drainage systems (SuDS). These measures by design ensure the stormwater leaving the site is to be attenuated and treated within the new development site boundary to ensure suitable quality, before discharging to the existing public surface water network, which subsequently outfalls to the nearby Pinkeen River.

The purpose of the proposed design is to:

- Treat runoff and remove pollutants to improve quality;
- Restrict outflow and to control quantity;
- Increase amenity value.

The layout of the proposed surface water drainage network is shown on Waterman Moylan Consulting Engineers Ltd (2023) Drawing Set included with this Application. It is proposed to strictly separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the local public surface water and wastewater sewer networks respectively. Run off from car park areas will discharge through interceptors.

10.5.2.2 Surface Water Flow and Quantity

The design has taken account of the potential impacts of the development on surface water flow; measures have been incorporated in the design to mitigate these potential impacts.

There are no direct discharges to any open water courses included in the design. As set out in the Waterman Moylan Consulting Engineers Ltd Engineering Assessment Report (2023) flow restriction is achieved by means of a hydro-brake, or similar approved, installed at the outfall manhole of each surface water catchment within the development, with the excess storm water stored on site for the duration of the storm periods of up to 1 in 100 years. The surface water network has been designed to provide sufficient capacity to contain and convey all surface water run-off associated with the 1-in-100-year event to the attenuation basins without any overland flooding.

The proposed development includes a new surface water network which will mitigate the pluvial risk to the site in line with SuDS measures.

Water conservation measures will be used, to reduce overall potable water demand and consumption, including low volume flush / dual flush WC's, spray taps, draw off tap controls, leak detection measures – through the metering of supply.

10.6 Residual Impacts

10.6.1 Construction Phase

10.6.1.1 Surface Water Quality

The implementation of the mitigation and monitoring measures detailed in Section 10.5 and 10.7, will ensure that the potential impacts on surface water quality during the construction phase are adequately mitigated. The residual effect on surface water quality during the construction phase is considered to be **neutral, imperceptible** and **short-term**.

10.6.1.2 Surface Water Flow and Quantity

The implementation of the mitigation and monitoring measures detailed in Section 10.5 and 10.7, will ensure that the potential impacts on surface water flow and quantity during the construction phase are

adequately mitigated. The residual effect on surface water flow and quantity during the construction phase is considered to be **neutral, imperceptible** and **short-term**.

10.6.1.3 Human Health and Populations

The implementation of the mitigation and monitoring measures detailed in Section 10.5 and 10.7, will ensure that the potential impacts on human health and populations (and material assets) during the construction phase are adequately mitigated. The residual effect on human health and populations during the construction phase is considered to be **neutral, imperceptible** and **short-term**.

10.6.1.4 Water Framework Directive Status

Even in the absence of the mitigation and monitoring measures detailed in Section 10.5 and 10.7, there will be no predicted degradation of the current water body (chemically, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

There are appropriately designed mitigation measures which will be implemented during the construction phase to protect the hydrological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment.

The residual effect on the WFD status during the construction phase is considered to be **neutral, imperceptible** and **short-term**.

10.6.2 Operational Phase

10.6.2.1 Surface Water

The implementation of the mitigation and monitoring measures detailed in Section 10.5 and 10.7, will ensure that the potential impacts on surface water quality once the proposed development is constructed and operational are adequately mitigated. The residual effect on surface water quality during the operational phase is considered to be **neutral, imperceptible** and **long-term**.

There will be no impact to the quality of downstream designated sites due to the lack of direct hydraulic connectivity, the significant distance between the subject development and designated areas, and the mitigation measures cited. In addition, overall the SuDS, attenuation proposed for the project and installation of hydrocarbon interceptors / separators will improve flood management and water quality.

10.6.2.2 Human Health and Populations

The implementation of the mitigation and monitoring measures detailed in Section 10.5 and 10.7, will ensure that the potential impacts on human health and populations (and material assets) once the proposed development is constructed and operational are adequately mitigated. The residual effect on human health and populations during the operational phase is considered to be **neutral, imperceptible** and **long-term**.

10.6.2.3 Water Framework Assessment

Even in the absence of the mitigation and monitoring measures detailed in Section 10.5 and 10.7, there will be no predicted degradation of the current water body (chemically, ecological and quantity) or any

impact on its potential to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

There are appropriately designed mitigation measures which will be implemented during the operational phase to protect the hydrological environment. There is a potential of accidental discharges during the operational phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment.

There are no untreated discharges of wastewater during the operational phase to any open waterbody / watercourse. The discharge to surface water sewer will be adequately treated via SuDS measures, hydro-brake (or equivalent) and oil/water interceptor / separator to ensure there is no long-term negative impact to the WFD water quality status of the receiving watercourse. The SuDS and proposed measures have been designed in detail with the ultimate aim of protecting the hydrological (& hydrogeological) environment. The SuDS and project design measures will be maintained correctly as per specifications to ensure long-term / on-going integrity of same.

10.7 Monitoring or Reinstatement

The management of hydrology during the construction phase will be monitored by the Contractor to ensure compliance with above-listed mitigation measures, and relevant water legislation and local authority requirements.

10.7.1 Construction Phase

During construction phase the following monitoring measures will be considered:

- Contractors will carry out regular inspections to confirm compliance with the CEMP. Daily inspections by contractors will address potential environmental impacts including dust, litter, waste management and general housekeeping.
- Regular inspection of surface water run-off and sediments controls (e.g., silt traps). Inspection and maintenance of the silt fences during construction phase is crucial to ensuring that they work as intended. They will remain in place throughout the entire.
- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off;
- Regular inspection of construction / mitigation measures (e.g., concrete pouring, refuelling, etc); and
- Silt Remediation treatment system.

10.7.2 Operational Phase

No future surface water monitoring is proposed for the proposed development due to the low hazard potential at the site.

Oil separators / petrol interceptors will be maintained and cleaned out in accordance with the manufacturer's instructions.

Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to surface water.

10.8 Interactions

Due to the inter-relationship between land, soils, geology, hydrogeology and hydrology, the assessed impacts and mitigation measures discussed will be considered applicable to both chapters.

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR. The main interactions of importance to land, soils, geology and hydrogeology relate to Biodiversity (Chapter 8), Land, soil, geology, hydrogeology (Chapter 9), and Air Quality (Chapter 11) as follows;

10.8.1 Biodiversity

The proposed development may have temporary negative impacts on biodiversity at site level, while it will not impose any impact on water quality within European Designated sites.

10.8.2 Climate and Flood Risk

The proposed development will not have negative impact on flood risk as a result of climate change. The proposed development is located within Flood Zone C. The proposed drainage plan incorporates adequate attenuation taking consideration of a climate safety factor.

10.8.3 Land, Soil, Geology, and Hydrogeology

In the absence of manmade drainage infrastructure during construction, stormwater run-off will continue to discharge to ground.

10.8.4 Air Quality

During construction of the proposed development, there will be a proportion of dust created that will impact air quality locally if not adequately mitigated.

10.9 Cumulative Impacts

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments are discussed below.

Existing developments that are already built and in operation contribute to the characterisation of the baseline environment. As such any further environmental impacts that the proposed development may have in addition to these already constructed and operational developments has been assessed in the preceding sections of this chapter.

This section has been prepared with reference to the list of other developments in the vicinity set out in Chapter 21 (Cumulative Impacts). Neither the development proposed nor any other developments will give rise to any significant impacts on surface water receptors and there are no predicted cumulative impacts in relation to surface water receptors in terms of water quality and flow, as a result of the proposed development in combination with existing / proposed plans or projects.

As has been identified in the receiving environment section all cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

10.9.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase.

In relation to the potential cumulative impact on hydrology during the construction phases, the construction works which would have potential cumulative impacts are as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses;
- Stockpiled material will be stored on hardstand away from surface water drains, and gullies will be protected during works to ensure there is no discharge of silt-laden water into the surrounding surface water drainage system;
- Contamination of local water sources from accidental spillage and leakage from construction traffic and construction materials is possible unless project-specific measures are put in place for each development and complied with.

The works contractors for other planned or permitted developments will be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019).

The implementation of mitigation and monitoring measures detailed here as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the hydrological environment during the construction phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible,** and **short-term**.

10.9.2 Operational Phase

In relation to the potential cumulative impact on hydrology during the operational phases, the operational activities which would have potential cumulative impacts are as follows:

- Increased hard standing areas will reduce local recharge to ground and increase surface water run-off potential if not limited to the green field run-off rate from the Site. Cumulatively this development and others in the area will result in localised reduced recharge to ground and increase in surface run-off.
- Increased risk of accidental discharge of hydrocarbons from car parking areas, the petrol station, and along roads is possible unless diverted to surface water system with petrol interceptor.
- There will be a small loss of greenfield area locally as part of the proposed Project.

This EIAR also considers the likelihood for cumulative impacts associated with the operational phase of the proposed development and the operational phase of these permitted developments. Increase in wastewater loading and water supply requirement is an impact of all development. Each development requires approval from Uisce Éireann confirming available capacity in the water and wastewater infrastructure. The surface water and foul drainage infrastructure and water supply requirements for the proposed development have been designed to accommodate the proposed development. The

impact of the foul flow based on the entire Church Fields lands (c. 1,000 No. units) on the Uisce Éireann network was assessed following the submission of a pre-connection enquiry form issued to Uisce Éireann. A Confirmation of Feasibility has been issued by Uisce Éireann on the 18th of April 2023 which confirms capacity for the subject site in the surrounding network. Please refer to Appendix A for the details. Exact figures are always required to be agreed with Uisce Éireann in a Wastewater Connection Application

Development will result in an increase in hard standing which will result in localised reduced recharge to ground and increase in run-off rate. Each permitted development is required by the Local Authority and Uisce Éireann to comply with the Local Authority and Uisce Éireann requirements by providing suitable attenuation on-site and ensure that there is no increase in off-site flooding as a result of the development in question.

All developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (Water Framework Directive and associated legislation, (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019)) such that they would be required to manage run-off quality..

The implementation of design and mitigation measures detailed in Section 10.5 as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change in surface water during the operational phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible** and **long-term**.

10.10 Difficulties Encountered

There were no difficulties encountered during the preparation of this report.

10.11 Conclusion

There will be **no long-term residual impact** on hydrological receptors, either within or in the vicinity of the proposed development as a result of the proposed development.

10.12 References

- CIRIA (2001). Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- CIRIA (2005). Environmental Good Practice on Site (C650).
- CIRIA (2007). CIRIA 697: The SUDS Manual.
- Department of Housing, Planning & Local Government (2018). River Basin Management Plan for Ireland 2018 – 2021.
- Eastern Regional Fisheries Board (2006). Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites.
- Enterprise Ireland (n.d.). Best Practice Guide BPGCS005: Oil Storage Guidelines.
- EPA (2023a). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- EPA (2023b). EPA Maps.

- GSI (2023). GSI Map Viewer.
- Institute of Geologists of Ireland (2013). Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- NPWS (2023). Designations Viewer.
- NRA (2009). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- OPW (2023). Flood Maps.
- OPW (2009). The Planning System and Flood Risk Management: Guidelines for Planning Authorities.
- Teagasc (2023). Teagasc Map Viewer.
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

11 Air Quality

11.1 Introduction

This chapter assesses the likely air quality impacts associated with the proposed residential development at Church Fields East, Mulhuddart, Dublin 15. A full description of the development is available in Chapter 5 – Description of the Proposed Development.

This chapter was completed by Dr. Avril Challoner. Avril is a Principal Environmental Consultant in the Air Quality and Climate section of AWN Consulting with 10 years' experience in Air Quality Consulting. She holds a BEng (Hons) in Environmental Engineering from the National University of Ireland Galway, HDip in Statistics from Trinity College Dublin and has completed a PhD in Environmental Engineering (Air Quality) in Trinity College Dublin. She is a Chartered Environmentalist (CEnv), Chartered Scientist (CSci), Member of the Institute of Environmental Management and Assessment, Member of the Institute of Air Quality Management and specialises in the fields of air quality, climate assessment, EIA and air dispersion modelling. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

11.2 Method

The principal guidance and best practice documents used to inform the assessment of potential impacts on Air Quality is summarised below.

In addition to specific air quality guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government, August 2018);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003); and
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017).

The assessment has made reference to national guidelines where available, in addition to international standards and guidelines relating to the assessment of air quality impacts. These are summarised below:

- PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects (Transport Infrastructure Ireland (TII), 2022);
- Guidance on the Assessment of Dust from Demolition and Construction V1.1 (Institute of Air Quality Management (IAQM) IAQM 2016) (hereafter referred to as the IAQM Guidelines);
- A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM 2020).

11.2.1 Criteria for Rating of Impacts

11.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Ambient Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022), which incorporate EU Directive 2008/50/EC, which has set limit values for a number of pollutants. The limit values for NO_2, PM_{10} and $PM_{2.5}$, are relevant to this assessment (see **Table 11.1**).

Table 11.1 Air Quality Standards Regulations

Pollutant	Regulation [Note 1]	Limit Type	Value
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/m^2/day
NOx	2008/50/EC	Critical level for protection of vegetation	30 $\mu g/m^3$ NO + NO2
Nitrogen Dioxide (NO2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 $\mu g/m^3$
		Annual limit for protection of human health	40 $\mu g/m^3$
Particulate Matter (as PM10)	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 $\mu g/m^3$ PM_{10}
		Annual limit for protection of human health	40 $\mu g/m^3$ PM_{10}
Particulate Matter (as PM2.5) Stage 1	2008/50/EC	Annual limit for protection of human health	25 $\mu g/m^3$ $PM_{2.5}$
Particulate Matter (as PM2.5) Stage 2 Note 2	2008/50/EC	Annual limit for protection of human health	20 $\mu g/m^3$ $PM_{2.5}$

[Note 1] EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

In April 2023, the Government of Ireland published the Clean Air Strategy for Ireland (Government of Ireland 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026 (shown in **Table 11.2**), the IT4 targets by 2030 and the final targets by 2040 (shown in **Table 11.2**). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 $\mu g/m^3$. The strategy also acknowledges that "*meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2*". Ireland will revise

its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets.

Table 11.2 WHO Air Quality Guidelines

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	WHO Air Quality Guidelines	24-hour limit for protection of human health	50µg/m^3 NO_2	50µg/m^3 NO_2	25µg/m^3 NO_2
		Annual limit for protection of human health	30µg/ m^3 NO_2	20µg/ m^3 NO_2	10µg/m^3 NO_2
PM (as PM_{10})		24-hour limit for protection of human health	75µg/ m^3 PM_{10}	50µg/m^3 PM_{10}	45µg/m^3 PM_{10}
		Annual limit for protection of human health	30µg/ m^3 PM_{10}	20µg/m^3 PM_{10}	15µg/m^3 PM_{10}
PM (as $PM_{2.5}$)		24-hour limit for protection of human health	37.5µg/m^3 $PM_{2.5}$	25µg/m^3 $PM_{2.5}$	15µg/m^3 $PM_{2.5}$
		Annual limit for protection of human health	15µg/m^3 $PM_{2.5}$5	10µg/m^3 $PM_{2.5}$	5µg/m^3 $PM_{2.5}$

11.2.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust that are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) and the EU ambient air quality standards outlined in **Table 11.1** have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Heritage & Local Government (DEHLG, 2004) apply the TA Luft limit of 350 mg/m^2/day to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

11.2.2 Construction Phase

11.2.2.1 Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2014) outlines an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site specific mitigation required. Transport Infrastructure Ireland (TII) recommends the use of the IAQM guidance (2014) in the TII guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a).

The major dust generating activities are divided into four types within the IAQM guidance (2014) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

11.2.2.2 Traffic Assessment

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

Waterman Moylan have prepared a Traffic and Transport Impact Assessment for the proposed development enclosed separately and have prepared Chapter 17 of this EIAR (Traffic and Transportation). It has been determined by Waterman Moylan that the construction stage traffic will not increase by 1,000 AADT, or 200 HDV AADT, the development will not result in speed changes or changes in road alignment. Therefore, the traffic does not meet the above scoping criteria. A detailed air quality assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

11.2.3 Operational Phase

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The TII scoping criteria detailed in Section 11.2.2.2 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air dispersion modelling assessment. Waterman Moylan have prepared a Traffic and Transport Impact Assessment for the proposed development enclosed separately and have prepared Chapter 17 of this EIAR (Traffic and Transportation). It has been determined by Waterman Moylan that the proposed development will result in the operational phase traffic increasing by more than 1,000 AADT on a small number of road links. Therefore, in accordance with the TII scoping criteria a detailed air dispersion modelling assessment of operational phase traffic emissions was conducted.

The impact to air quality as a result of changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (2022a) states that a proportionate number of representative receptors which are located in areas that will experience the highest concentrations or greatest improvements as a result of the proposed development are to be included in the modelling. The TII criteria state that receptors within 200m of impacted road links should be assessed; roads which are more than 200m from a receptor will not impact pollutant concentrations at that receptor. The TII guidance (2022a) defines sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e. locations where members of the public are likely to be regularly present. A total of 4 no. high sensitivity residential receptors (R1 – R4) were included in the modelling assessment (see **Figure 11.1**).

The TII guidance (2022a) states that modelling should be conducted for NO_2, PM_{10} and $PM_{2.5}$ for the Base, Opening and Design Years for both the Do Minimum (Do Nothing) and Do Something scenarios. Modelling of operational NO_2, PM_{10} and $PM_{2.5}$ concentrations has been conducted for the Do Nothing and Do Something scenarios using the TII Road Emissions Model (REM) online calculator tool (TII, 2022b).

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The *Default* fleet mix option was selected along with the *Intermediate Case* fleet data base selection, as per TII Guidance (TII, 2022b). The *Intermediate Case* assumes a linear interpolation between the *Business as Usual* case – where current trends in vehicle ownership continue and the *Climate Action Plan (CAP)* case – where adoption of low emission light duty vehicles occurs.

Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the identified sensitive receptors using generic meteorological data. The TII REM uses county-based Irish fleet composition for different road types, for different European emission standards from pre-Euro to Euro 6/VI with scaling factors to reflect improvements in fuel quality, retrofitting, and technology conversions. The TII REM also includes emission factors for PM_{10} emissions associated with brake and tyre wear (TII, 2022b). The predicted road contributions are then added to the existing background concentrations to give the predicted ambient concentrations. The ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

11.2.3.1 Traffic Data Used in Modelling Assessment

Traffic flow information detailed in **Table 11.3** was obtained from Waterman Moylan for the purposes of this assessment. Data for the Base Year 2022 and the Do Nothing and Do Something scenarios for the Opening Year 2026 and Design Year 2041 were provided. Indicative locations of these road links are shown in **Figure 11.1**. A conservative growth factor has been applied to the traffic data to allow for cumulative development within the area. Specific cumulative developments were also investigated but it was found that there were no specific permitted developments that would lead to cumulative traffic impacts due to their increased distance from the site (see Chapter 17 for further details).

The modelling assessment has been undertaken for road links that were within 200m of receptors, including the access road to the Eastern Linear Park as this met the TII scoping criteria. Background concentrations have been included as per Section 11.3.2 of this chapter based on available EPA background monitoring data (EPA, 2022).

Table 11.3 Traffic Data used in Air Modelling Assessment

Road Name	Speed (kph)	Base Year	Opening Year		Design Year	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Junction 1_arm A	60	10698 (930)	12488 (1086)	12955 (1127)	13600 (1183)	14067 (1223)
Junction 1_arm B	50	273 (6)	2004 (41)	2714 (55)	2318 (47)	3028 (62)
Junction 1_arm C	60	10520 (915)	3430 (70)	4850 (99)	12643 (1099)	12843 (1117)
Junction 1_arm D	50	71 (1)	2004 (41)	2714 (55)	82 (2)	82 (2)
Junction 2_arm A	50	2953 (91)	0 (0)	0 (0)	3243 (100)	3255 (101)
Junction 2_arm B	60	18947 (586)	0 (0)	0 (0)	20774 (643)	20991 (649)
Junction 2_arm C	60	14799 (458)	0 (0)	13600 (1183)	16199 (501)	16462 (509)
Junction 2_arm D	50	11496 (235)	0 (0)	2318 (47)	12641 (258)	12641 (258)
Junction 2_arm E	60	12444 (1082)	12955 (1127)	12643 (1099)	13553 (1179)	14020 (1219)
Junction 3_arm A	50	12750 (129)	2999 (61)	82 (2)	14637 (148)	14637 (148)
Junction 3_arm B	50	6245 (63)	11749 (1022)	3243 (100)	7857 (79)	8103 (82)
Junction 3_arm C	50	14253 (144)	75 (2)	20774 (643)	17094 (173)	17351 (175)
Junction 3_arm D	50	7854 (79)	2965 (92)	16199 (501)	10435 (105)	10938 (110)
Junction 4_arm A	50	3258 (33)	19164 (593)	12641 (258)	5764 (58)	6481 (65)
Junction 4_arm B	50	6670 (136)	15063 (466)	13553 (1179)	9063 (185)	9560 (195)
Junction 4_arm C	30	1395 (14)	11496 (235)	14637 (148)	1602 (16)	1602 (16)
Junction 4_arm D	50	4482 (91)	12912 (1123)	7857 (79)	5749 (117)	5961 (122)

Road Name	Speed (kph)	Base Year	Opening Year		Design Year	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Junction 5_arm A	50	0 (0)	13311 (134)	17094 (173)	2004 (41)	2714 (55)
Junction 5_arm B	30	0 (0)	7453 (75)	10435 (105)	3430 (70)	4850 (99)
Junction 5_arm C	50	0 (0)	15869 (160)	5764 (58)	2004 (41)	2714 (55)
Junction 5_arm D	30	0 (0)	10121 (102)	9063 (185)	0 (0)	0 (0)

Figure 11.1 Sensitive Receptors and Indicative Road Links Included in Operational Phase Air Quality Modelling Assessment

There are no ecological sites within 200m of any impacted road links. As a result, a detailed assessment has been scoped out as there is no potential for significant impacts to designated ecology from traffic emissions.

11.2.4 Air Quality Significance Criteria

The TII document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the do-nothing scenario. The

TII significance criteria are outlined in Table 4.9 of *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a) and reproduced in **Table 11.4** below. These criteria have been adopted for the proposed development to predict the impact of NO_2, PM_{10} and $PM_{2.5}$ emissions as a result of the proposed development.

Table 11.4 Air Quality Significance Criteria

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Standard Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: TII (2022a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

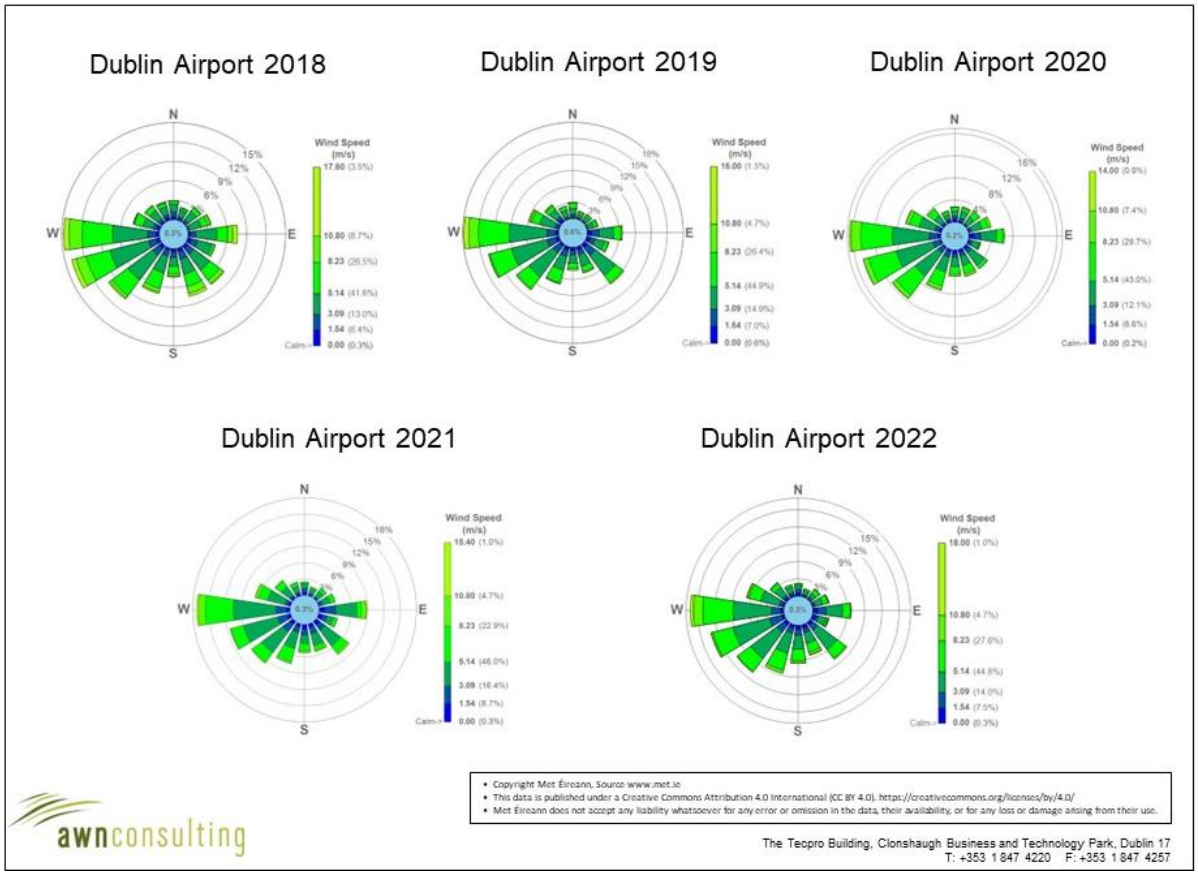
11.3 Baseline Environment

11.3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality are the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 9 km east of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see **Figure 11.2**). For data collated during five representative years (2018 – 2022), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.3 m/s over the 30-year period of 1990 - 2010 (Met Éireann, 2022).

Figure 11.2 Dublin Airport Windrose 2018 – 2022



Source: Met Éireann, 2022

11.3.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is "*Air Quality In Ireland 2021*" (EPA, 2022a). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2022b).

As part of the implementation of the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022) four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2022b). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone A (EPA, 2022b). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.). In the area of the proposed development, the background sources within a kilometre of the site include a number of EPA licenced emission points (P1060-01, P1030-01, P0552-03 and P0522-01) to the east and west.

In 2020, the EPA reported (EPA, 2021) that Ireland was compliant with EU legal air quality limits at all location. However, this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA *Air Quality in Ireland 2020* report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a

dominant source. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. Therefore, data for 2020 is shown for representative purposes only and has not been used in determining the background levels of pollutants in this assessment.

Long-term NO_2 monitoring was carried out at the Zone A suburban background locations of Rathmines, Dún Laoghaire, Swords and Ballyfermot for the period 2016 – 2021 (EPA, 2022a). Long term average concentrations are significantly below the annual average limit of 40 µg/m^3. Average results range from 11 – 22 µg/m^3 for the suburban background locations. The NO_2 annual average for this six year period suggests an upper average limit of no more than 19 µg/m^3 (**Table 11.5**) for the urban background locations. The monitoring site in Swords is the most representative of the proposed development location. Concentrations of NO_2 at the Swords site ranged from 11 – 16 µg/m^3 over the period 2016 – 2021. Based on the above information, a conservative estimate of the current background NO_2 concentration for the region of the proposed development is 17 µg/m^3.

Table 11.5 Trends In Zone A Air Quality - Nitrogen Dioxide (NO_2)

Station	Averaging Period [Note 1]	Year					
		2016	2017	2018	2019	2020	2021
Rathmines	Annual Mean NO_2 (µg/m^3)	20	17	20	22	13	14
	Max 1-hr NO_2 (µg/m^3)	102	116	138	183	170	143
Dun Laoghaire	Annual Mean NO_2 (µg/m^3)	19	17	19	15	14	16
	Max 1-hr NO_2 (µg/m^3)	142	153	135	104	92	93
Swords	Annual Mean NO_2 (µg/m^3)	16	14	16	15	11	11
	Max 1-hr NO_2 (µg/m^3)	206	107	112	108	84	79
Ballyfermot	Annual Mean NO_2 (µg/m^3)	17	17	17	20	12	13
	Max 1-hr NO_2 (µg/m^3)	127	148	217	124	108	90

[Note 1] *Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011). 1-hour limit value - 200 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).*

Continuous PM_{10} monitoring was carried out at five Zone A locations from 2016 - 2021, Ballyfermot, Rathmines, Dún Laoghaire, Tallaght and Phoenix Park. These showed an upper average limit of no more than 16 µg/m^3 (**Table 11.6**). Levels range from 9 - 16 µg/m^3 over the six year period with at most 9 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m^3 in 2019 (35 exceedances are permitted per year) (EPA, 2022a). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 16 µg/m^3.

Table 11.6 Trends In Zone A Air Quality - PM_{10}

Station	Averaging Period [Note 1]	Year					
		2016	2017	2018	2019	2020	2021
Ballyfermot	Annual Mean PM_{10} ($\mu g/m^3$)	11	12	16	14	12	12
	24-hr Mean > 50 $\mu g/m^3$ (days)	0	1	0	7	2	0
Dún Laoghaire	Annual Mean PM_{10} ($\mu g/m^3$)	13	12	13	12	12	11
	24-hr Mean > 50 $\mu g/m^3$ (days)	0	2	0	2	0	0
Tallaght	Annual Mean PM_{10} ($\mu g/m^3$)	14	12	15	12	10	10
	24-hr Mean > 50 $\mu g/m^3$ (days)	0	2	1	3	0	0
Rathmines	Annual Mean PM_{10} ($\mu g/m^3$)	15	13	15	15	11	12
	24-hr Mean > 50 $\mu g/m^3$ (days)	3	5	2	9	2	0
Phoenix Park	Annual Mean PM_{10} ($\mu g/m^3$)	11	9	11	11	10	10
	24-hr Mean > 50 $\mu g/m^3$ (days)	0	1	0	2	0	0

[Note1] *Annual average limit value - 40 $\mu g/m^3$ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2022). Daily limit value - 50 $\mu g/m^3$ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).*

Average $PM_{2.5}$ levels in Rathmines over the period 2016 - 2021 ranged from 8 - 10 $\mu g/m^3$, with a $PM_{2.5}/PM_{10}$ ratio ranging from 0.68 – 0.75 (EPA, 2022a). Based on this information, a conservative ratio of 0.7 was used to generate an existing $PM_{2.5}$ concentration in the region of the development of 11.2 $\mu g/m^3$.

Based on the above information the air quality in the suburban Dublin area is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2 with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2022).

The current estimated background concentrations have been used in the operational phase air quality assessment for both the opening and design year as a conservative approach in order to predict pollutant concentrations in future years. This is in line with the TII methodology (TII, 2022a).

11.3.3 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2014) prior to assessing the impact of dust from a proposed development, the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

In terms of receptor sensitivity to dust soiling, there are some residential properties with 50m of the proposed works area. In addition, another recently permitted residential development Church Fields (Planning Reg. Ref.: PARTXI/012/21) is located to the immediate west of the proposed development. It can conservatively be assumed that it will be built and occupied during the construction phase for Church Fields East. Tyrrelstown Educate Together School is a sensitive receptor located within 100m of the main works area of the proposed development site (**Figure 11.3**). In addition, some residential properties are also currently under construction within the Wellview Estate (Planning Reg. Ref.: PARTXI/006/18). Schools can be treated as being in the >100 receptor category due to the number of people in occupation on a daily basis. Worst case receptors have been used for this assessment where impacts are expected to be highest. Based on the IAQM criteria outlined in **Table 11.7**, the worst-case sensitivity of the area to dust soiling is considered high.

Table 11.7 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 16 µg/m^3 and as discussed above, there are a number of new construction projects in the area that have the potential to result in receptors within a 20m buffer of the redline boundary. Based on the IAQM criteria outlined in **Table 11.8**, the worst-case sensitivity of the area to human health is considered low.

Table 11.8 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM10 Concentration	Number Of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
High	< 24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low	Low

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant, as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50m from the site and 50m from site access roads, up to 500m for the site entrance. There are no sensitive ecological receptors within these criteria. Based on the IAQM criteria outlined ecology impacts are considered to be scoped out with respect to construction phase dust.

Figure 11.3 Location of Sensitive Receptors

11.4 Predicted Impacts of the Proposed Development

11.4.1 Do-Nothing Impact

Under the Do Nothing Scenario, no construction works will take place and the identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. Impacts from increased traffic volumes and associated air emissions will also not occur. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from new developments in the surrounding area, changes in road traffic, etc.). Therefore, this scenario can be considered neutral in terms of air quality.

11.4.2 Construction Phase

11.4.2.1 Dust

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 11.3.3). The major dust generating activities are divided into four types within the IAQM (2016) guidance to reflect their different potential impacts.

These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

Demolition

No demolition is required for the proposed development therefore, the assessment is scoped out.

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large**: Total site area > 10,000 m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved >100,000 tonnes;
- **Medium**: Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes;
- **Small**: Total site area < 2,500 m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

The total developable site area is approximately 55,200 m^2 which is greater than 10,000 m^2, therefore the proposed earthworks can be classified as large. The sensitivity of the area, as determined in Section 11.3.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in **Table 11.9** and **Table 11.10**, combining

the large dust emission magnitude with a high sensitivity to dust soiling and low sensitivity to human health impacts, results in an overall high risk of dust impacts as a result of the proposed earthworks activities in the absence of mitigation.

Table 11.9 Criteria for Rating Risk of Dust Impacts – Earthworks (IAQM, 2016)

Sensitivity of Area	Dust Emission Magnitude – Earthworks		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 11.10 Risk of Dust Impacts – Earthworks

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust-Related Impacts
Dust Soiling	High	Large	High
Human Health	Low		Low

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total building volume > 100,000 m^3, on-site concrete batching, sandblasting;
- **Medium:** Total building volume 25,000 m^3 – 100,000 m^3, potentially dustyconstruction material (e.g. concrete), on-site concrete batching;
- **Small:** Total building volume < 25,000 m^3, construction material with low potentialfor dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as medium as a worst-case, as the total building volume will be less than 100,000 m^3. As outlined in **Table 11.11** and **Table 11.12**, combining the large dust emission magnitude with a high sensitivity to dust soiling and low sensitivity to human health impacts, results in an overall medium risk of dust impacts as a result of the proposed construction activities in the absence of mitigation.

Table 11.11 Criteria for Rating Risk of Dust Impacts – Construction (IAQM, 2016)

Sensitivity of Area	Dust Emission Magnitude – Construction		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 11.12 Risk of Dust Impacts – Construction

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Construction	Risk of Dust-related Impacts
Dust Soiling	High	Medium	Medium
Human health	Low		Low

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100m;
- **Medium:** 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100m;
- **Small:** < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50m.

The dust emission magnitude for the proposed trackout can be classified as medium as there will be less than 50 outward HGV movements per day. As outlined in **Table 11.13** and **Table 11.14**, combining the large dust emission magnitude with a high sensitivity to dust soiling and low sensitivity to human health impacts, results in an overall medium risk of dust impacts as a result of the proposed trackout activities in the absence of mitigation.

Table 11.13 Criteria for Rating Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude – Trackout		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 11.14 Risk of Dust Impacts – Trackout

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Trackout	Risk of Dust-related Impacts
Dust soiling	High	Medium	Medium
Human health	Low		Low

Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in **Table 11.15** for each activity. The magnitude of risk determined is used to prescribe the level of site specific mitigation required for each activity to prevent significant impacts occurring.

Overall, to ensure that no dust nuisance occurs during the earthworks, construction and trackout activities, a range of dust mitigation measures associated with a high risk of dust impacts must be implemented. When the dust mitigation measures detailed in the mitigation section of this chapter (Section 11.5.1) and **Appendix 11.1** are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors. In the absence of mitigation dust impacts are predicted to be **short-term, localised, negative and slight**.

Table 11.15 Summary of construction phase dust impact risk used to define site-specific mitigation

Potential Impact	Dust Emission Magnitude			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	High Risk	Medium Risk	Medium Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk

11.4.2.2 Traffic

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII assessment criteria in Section 11.2.2.2.

It can therefore be determined that the construction stage traffic will have an **imperceptible,neutral and short-term impact** on air quality.

11.4.2.3 Construction Phase Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM10 and PM2.5 emissions. As per section 11.3.3 the surrounding area is of low sensitivity to dust related human health impacts. It was determined that there is an overall low risk of dust related human health impacts as a result of the construction phase of the proposed development (**Table 11.15**). Therefore, in the absence of mitigation there is the potential for **imperceptible, negative, short-term impacts** to human health as a result of the proposed development.

11.4.3 Operational Phase

11.4.3.1 Traffic

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The traffic data includes the Do Nothing and Do Something scenarios. The impact of NO_2, PM_{10} and $PM_{2.5}$ emissions for the Opening and Design Years was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

The TII guidance PE-ENV-01106 (TII, 2022a) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects. However, this significance criteria can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, to determine the degree of impact.

The results of the assessment of the impact of the proposed development on NO_2 in the Opening Year 2026 and Design Year 2041 are shown in **Table 11.16**. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2026 and 2041. Concentrations of NO_2 are at most 47% of the annual limit value in 2026 and 44% of the annual limit value in 2041. There are predicted to be some increases in traffic between the Opening and Design Years. Therefore, any decrease in concentration is due to increased uptake in electric vehicles and lower vehicle exhaust emissions. In addition, the TII guidance (2022a) states that the hourly limit value for NO_2 of 200 µg/m^3 is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m^3. As predicted NO_2 concentrations are significantly below 60 µg/m^3 (**Table 11.16**) it can be concluded that the short-term NO_2 limit value will be complied with at all receptor locations.

The impact of the proposed development on annual mean NO_2 concentrations can be assessed relative to "Do Nothing (DN)" levels. NO_2 concentrations at the receptors assessed will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.20 µg/m^3 at receptor R1, this is a 1.1% change from baseline conditions. Where the predicted annual mean concentrations are less than 75% of the air quality standard (see **Table 11.1**) and there is a less than 5% change in concentrations compared with the Do-Nothing scenario, then, the impact is considered neutral as per the TII significance criteria (see **Table 11.4**). Therefore, the impact of the proposed development on NO_2 concentrations is **neutral.**

In relation to changes in PM_{10} concentrations as a result of the proposed development, the results of the assessment can be seen in **Table 11.17** for the opening year 2026 and design year 2041. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2026 and 2041. Concentrations of PM_{10} are at most 44% of the annual limit value in 2026 and 2041. In addition, the proposed development will not result in any exceedances of the daily PM_{10} limit value of 50 µg/m^3. The impact of the proposed development on annual mean PM_{10} concentrations can be assessed relative to "Do Nothing (DN)" levels. PM_{10} concentrations at the receptors assessed will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.16 µg/m^3 at receptor R1, this is a 1% change from baseline conditions. As with NO_2, where the predicted annual mean concentrations are less than 75% of the air quality standard (see **Table 11.1**) and there is a less than 5% change in concentrations compared with the Do-Nothing scenario then the impact is considered neutral as per the TII significance criteria (see **Table 11.4**). Therefore, the impact of the proposed development on PM_{10} concentrations is **neutral**.

In relation to changes in $PM_{2.5}$ concentrations as a result of the proposed development, the results of the assessment can be seen in **Table 11.18** for the Opening Year 2026 and Design Year 2041. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2026 and 2041. Concentrations of $PM_{2.5}$ are at most 48% of the annual limit value in 2026 and 2041. The impact of the proposed development on annual mean $PM_{2.5}$ concentrations can be assessed relative to "Do Nothing (DN)" levels. $PM_{2.5}$ concentrations at the receptors assessed will increase as a result of the

proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.09 µg/m^3 at receptor R2, this is a 0.8% change from baseline conditions. As with NO_2, where the predicted annual mean concentrations are less than 75% of the air quality standard (see **Table 11.1**) and there is a less than 5% change in concentrations compared with the Do-Nothing scenario, then, the impact is considered neutral as per the TII significance criteria (see **Table 11.4**). Therefore, the impact of the proposed development on PM_{10} concentrations is **neutral.**

Overall, the potential impact of the proposed development on ambient air quality in the operational stage when compared to the EU limit values is considered **long-term, localised, neutral, imperceptible and non-significant**.

Table 11.16 Predicted Annual Mean NO_2 Concentrations (µg/m^3)

Receptor	Impact Opening Year				Impact Design Year			
	DN	DS	DS-DN	Description	DN	DS	DS-DN	Description
R1	17.5	17.7	0.20	Neutral	17.2	17.3	0.07	Neutral
R2	17.5	17.7	0.19	Neutral	17.2	17.3	0.08	Neutral
R3	18.2	18.2	0.04	Neutral	17.5	17.5	0.01	Neutral
R4	18.6	18.8	0.19	Neutral	17.7	17.7	0.07	Neutral

Table 11.17 Predicted Annual Mean PM_{10} Concentrations (µg/m^3)

Receptor	Impact Opening Year				Impact Design Year			
	DN	DS	DS-DN	Description	DN	DS	DS-DN	Description
R1	16.4	16.6	0.16	Neutral	16.4	16.5	0.15	Neutral
R2	16.5	16.6	0.15	Neutral	16.4	16.6	0.16	Neutral
R3	17.2	17.2	0.04	Neutral	17.2	17.3	0.03	Neutral
R4	17.4	17.5	0.15	Neutral	17.4	17.6	0.15	Neutral

Table 11.18 Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)

Receptor	Impact Opening Year				Impact Design Year			
	DN	DS	DS-DN	Description	DN	DS	DS-DN	Description
R1	11.4	11.5	0.08	Neutral	11.4	11.5	0.08	Neutral
R2	11.5	11.5	0.09	Neutral	11.4	11.5	0.09	Neutral
R3	11.9	11.9	0.02	Neutral	11.9	11.9	0.01	Neutral
R4	12.0	12.0	0.08	Neutral	12.0	12.1	0.09	Neutral

11.4.3.2 Human Health

Traffic related air emissions have the potential to impact air quality which can affect human health. A detailed air dispersion modelling assessment of traffic emissions was conducted and it was determined that emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health. Therefore, it can be determined that the impact to human health during the operational stage is **long-term, neutral and imperceptible**.

11.5 Mitigation Measures

11.5.1 Construction Phase

The proactive control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can

be found in **Appendix 11.1**. These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site. The CEMP has been prepared by Brady Shipman Martin (BSM) and is enclosed separately. The CEMP will be a working document and will be finalised by the Contractor following appointment and prior to commencing works on site.

The Dust Management Plan notes the following measures in summary:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- Drop heights from conveyors, loading shovels, hoppers and other loading equipment will be minimised, if necessary fine water sprays should be employed.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

11.5.2 Operational Phase

There is no mitigation required for the operational phase of the development as impacts to air quality are predicted to be **neutral** and **imperceptible**.

11.6 Residual Impacts

11.6.1 Construction Phase

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Dust Management Plan (**Appendix 11.1**). Provided the dust minimisation measures outlined in the plan are adhered to, the predicted residual air quality impacts during the construction phase are **short-term, direct, negative, localised** and **imperceptible**.

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values, which are based on the protection of human health (see **Table 11.1**). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is **negative, direct, short-term** and **imperceptible.**

11.6.2 Operational Phase

Dispersion modelling of traffic emissions at sensitive receptors in proximity to impacted road links during the operational phase indicate pollutant emissions will be in compliance with the relevant air quality standards. Section 11.4.3 determined that the impact to air quality as a result of increased traffic volumes during the operational phase of the proposed development will be **localised, neutral, direct, imperceptible** and **long-term.**

Emissions of air pollutants during the operational phase are predicted to be significantly below the ambient air quality standards, which are based on the protection of human health. Therefore, residual impacts to human health related to air quality will be **long-term, neutral, direct** and **imperceptible.**

11.7 Monitoring

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m^2/day during the monitoring period of 30 days (+/- 2 days).

11.8 Reinstatement

Reinstatement is not required.

11.9 Interactions

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted impact is **short-term, imperceptible** and **negative** with respect to population and human health during construction and **long-term, imperceptible** and **neutral** during operation phase.

Interactions between air quality and traffic (Chapter 17) can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be **long-term, imperceptible** and **neutral**.

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter (Chapter 12). There is no impact on climate due to air quality however the sources of impacts on air quality and climate are strongly linked.

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils.

As set out in Chapter 9 (Land, Soils, Geology and Hydrogeology), dust generation can occur during extended dry weather periods as a result of construction traffic. Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods and vehicle wheel washes will be installed, for example. The works involve stripping of topsoil and excavations, which will remove

some vegetation such as trees and scrub. It will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary during construction phase and is not anticipated to have a significant impact on biodiversity.

The impact of the interactions between land, climate, soils and geology, biodiversity and air quality are considered to be **short-term, imperceptible** and **neutral**.

No other significant interactions with air quality have been identified.

11.10 Cumulative Impacts

11.10.1 Construction Phase

According to the IAQM guidance (2016) should the construction phase of the proposed development coincide with the construction phase of any other developments within 350m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors. Developments which have the potential to impact included (see **Table 21.1** and **Figure 21.1** for further details):

- Church Fields (Planning Reg. Ref.: PARTXI/010/19)
- Church Fields (Planning Reg. Ref.: PARTXI/011/19)
- Church Fields (Planning Reg. Ref.: PARTXI/012/21)
- Wellview Estate (Planning Reg. Ref.: PARTXI/006/18)
- Powerstown Educate Together National School (Planning Reg. Ref.: FW22A/0287)

However, provided the mitigation measures outlined in Section 11.5 and **Appendix 11.1**, are implemented throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted.

With mitigation measures (as per Section 11.5) in place, there are no significant cumulative impacts to air quality predicted for the construction phase.

11.10.2 Operational Phase

The traffic data used to assess the operational stage impacts to air quality included the cumulative traffic associated with the proposed development as well as other existing and permitted developments in the local area (see Chapter 17 Traffic and Transport). Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be **long-term, neutral** and **imperceptible** with regards to air quality.

11.11 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

11.12 References

BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites

Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Dublin City Council (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

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

Environmental Protection Agency (2022) Air Quality Monitoring Report 2021 (& previous annual reports)

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

Institute of Air Quality Management (IAQM) (2016) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1

Met Éireann (2023) Met Eireann website: https://www.met.ie/

The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

Transport Infrastructure Ireland (2022a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

Transport Infrastructure Ireland (2022b) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)

12 Climate

12.1 Introduction

This chapter assesses the likely Climate impacts associated with the proposed residential development at Church Fields East, Mulhuddart, Dublin 15. A full description of the development is available in Chapter 5 – Description of the Proposed Development.

This chapter was completed by Dr. Avril Challoner. Avril is a Principal Environmental Consultant in the Air Quality and Climate section of AWN Consulting with 10 years' experience in Air Quality Consulting. She holds a BEng (Hons) in Environmental Engineering from the National University of Ireland Galway, HDip in Statistics from Trinity College Dublin and has completed a PhD in Environmental Engineering (Air Quality) in Trinity College Dublin. She is a Chartered Environmentalist (CEnv), Chartered Scientist (CSci), Member of the Institute of Environmental Management and Assessment, Member of the Institute of Air Quality Management and specialises in the fields of air quality, climate assessment, EIA and air dispersion modelling. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

12.2 Method

The principal guidance and best practice documents used to inform the assessment of potential impacts on Climate are summarised below.

In addition to specific climate guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022a);
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017).

The assessment has made reference to national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a);
- Transport Infrastructure Ireland (TII) PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (PE-ENV-01105) (TII, 2022b);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2022c);
- Institute of Environmental Management & Assessment (IEMA) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the IEMA 2022 GHG Guidance) (IEMA, 2022);
- IEMA Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the IEMA 2020 EIA Guide) (IEMA, 2020a);
- IEMA GHG Management Hierarchy (hereafter referred to as the IEMA 2020 GHG Management Hierarchy) (IEMA, 2020b);
- IEMA Principles Series: Climate Change Mitigation & EIA (IEMA, 2010);

- Publicly Available Specification (PAS) 2080:2016 on Carbon Management in Infrastructure (BSI, 2016); and
- Technical guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a).

12.2.1 Climate Agreements

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland '*to* pursue*, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050*' (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022) with an Annex of Action published in March 2023.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act) in March 2021. The Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021b) is to provide for the approval of plans "for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050". The 2021 Climate Act will also "provide for carbon budgets and a decarbonisation target range for certain sectors of the economy". The 2021 Climate Act defines the carbon budget as "the total amount of greenhouse gas emissions that are permitted during the budget period".

In relation to carbon budgets, the 2021 Climate Action and Low Carbon Development (Amendment) Act states that 'a carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')'. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 12.1. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge

in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of Greenhouse Gas (GHG) emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published in July 2022 and are shown in Table 12.2. Buildings (Residential) have a 40% reduction requirement and a 2030 emission ceiling of 4 $MtCO_2eq$[18].

Table 12.1 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025

Sector	Reduction Required	2018 Emissions ($MtCO_2eq$)
2021-2025	295 Mt CO_2eq	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2eq	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2eq	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 12.2 Sectoral Emission Ceilings 2030

Sector	Reduction Required	2018 Emissions ($MtCO_2eq$)	2030 Emission Ceiling ($MtCO_2eq$)
Electricity	75%	10.5	3
Transport	50%	12	6
Buildings (Commercial and Public)	45%	2	1
Buildings (Residential)	40%	7	4
Industry	35%	7	4
Agriculture	25%	23	17.25
Other (F-Gases, Waste and Petroleum refining)	50%	2	1

In December 2022, CAP23 was published (Government of Ireland 2022). This is the first CAP since the publication of the carbon budgets and sectoral emissions ceilings, and it aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030. The CAP has six vital high impact sectors where the biggest savings can be made: renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use. CAP23 states that the decarbonisation of Ireland's manufacturing industry is key for Ireland's economy and future competitiveness. There is a target to reduce the embodied carbon in construction materials by 10% for materials produced and used in Ireland by 2025 and by at least 30% for materials produced and used in Ireland by 2030. CAP23 states that these reductions can be brought about by product substitution for construction materials and reduction of clinker content in cement. Cement and other high embodied carbon construction elements can be reduced by the adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction. In order to ensure economic growth can continue alongside a reduction in emissions, the IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies.

[18] Mt CO_2eq denotes million tonnes carbon dioxide equivalent

In April 2023 the Government published a draft Long-term Strategy on Greenhouse Gas Emissions Reductions (Government of Ireland 2023). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan. The strategy will be updated on the basis of a second round of public consultation throughout 2023 with an updated strategy published after this is complete.

The Fingal County Council Climate Change Action Plan published in 2019 (Fingal County Council and Codema, 2019) outlines a number of goals and plans to prepare for and adapt to climate change. A progress report of the plan is presented annually. There are five key action areas within the plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management. Some of the measures promoted within the Action Plan under the 5 key areas involve building retrofits, energy master-planning, development of segregated cycle routes, the promotion of bike share schemes, development of flood resilient designs, promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the Fingal County Council area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Action Plan and incorporate climate friendly designs and measures where possible. In 2023 Fingal County Council sought to increase the level of ambition to align with the actions and targets in the CAP23. The Fingal County Council targets include reducing carbon emissions by 30% and increasing energy efficiency by 33% by 2030 will be increased to 50% respectively.

12.2.2 Construction Phase

12.2.2.1 Greenhouse Gas Assessment

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 12.3). The impact of the proposed development on climate is determined in relation to this baseline. As per the IEMA guidance (2022) where expected emissions will not increase by over 1% compared with the baseline scenario then no further assessment is required as there is no potential for significant impacts to climate. However, the construction stage activities and potential for GHG emissions have been reviewed as part of the construction stage climate assessment and a quantitative assessment conducted.

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2022c). Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The TII Online Carbon Tool (TII, 2022c) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013), UK National Highways Carbon Tool v2.4 and UK Government 2021 Greenhouse Gas Reporting Conversion Factors. The tool aligns with PAS 2080. The carbon emissions are calculated by multiplying the emission factor by the quantity of the material that will be used over the entire construction / maintenance phase.

The TII Online Carbon Tool (TII, 2022c) has been commissioned by TII to assess GHG emissions associated with road or rail projects using Ireland-specific emission factors and data. Given the nature of the proposed development, use of the TII carbon tool was not ideal for the building elements at an

early design stage. An alternative tool, OneClickLCA Carbon Designer Tool for Ireland[19] from the Green Building Council, with support from the Land Development Agency (LDA) and the Environmental Protection Agency (EPA), has been utilised as an alternative to the TII Carbon Tool for the building elements. OneClickLCA is certified to EN 15978, EN 15978, ISO 21931–1 & ISO 21929, & data requirements of ISO 14040 & EN 15804, and is LEED, BREEAM and PAS 2080 aligned. The carbon designer tool is aimed at providing an early-stage lifecycle estimate for the carbon impact of the proposed development. The tool includes build ups common in the Irish market, and some alternatives.

12.2.2.2 Traffic Assessment

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO_2) which will impact climate.

The UK Highways Agency DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency, 2019) contains the following scoping criteria to determine whether a detailed climate assessment is required for a proposed project during the construction stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

PE-ENV-01104 (TII, 2022c) states that road traffic related emissions information should be obtained from an Air Quality Practitioner to show future user emissions during operation without the development in place. The Air Quality Practitioner calculated the traffic related emissions through the use of the TII REM tool (TII, 2022b) which includes detailed fleet predictions for age, fuel technology, engine size and weight based on available national forecasts. An air quality construction phase assessment has been scoped out as the change in construction traffic does not meet the scoping criteria. In addition, transportation emissions have been included with the carbon calculators. As a result a detailed assessment of construction stage traffic related carbon dioxide (CO_2) emissions was scoped out in order to prevent double counting.

[19] https://www.igbc.ie/carbon-designer-for-ireland/

12.2.3 Operation Phase

12.2.3.1 Climate Change Vulnerability Assessment

The operational phase assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- EU (2021) Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in Section 12.2.2.1, future climate change modelling and input from other experts working on the proposed development (i.e. hydrologists) should be used in order to assess the likelihood of a climate risk.

The initial stage of an assessment is to establish a scope and boundary for the assessment taking into account the following criteria:

- Spatial boundary: As per PE-ENV-01104 (TII, 2022a), the study area with respect to the GHGA is Ireland's Climate budget. The study area with respect to the CCRA can be considered the project boundary and its assets. The study area will be influenced by current and future baselines (Section 12.2.2.1). This study area is influenced by the input of other experts within the EIAR team;
- Climate hazards: The outcomes of the climate screening i.e. vulnerability assessment and baseline assessment; and
- Project receptors: TII state that the project receptors are the asset categories considered in the climate screening. In addition, any critical connecting infrastructure and significant parts of the surrounding environment e.g. water bodies that should be considered as a part of the indirect, cumulative and in combination impact assessment should also be considered project receptors.

Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (European Commission, 2021a) outlines an approach for undertaking a climate change risk assessment where there is a potentially significant impact on the proposed development due to climate change. The risk assessment assesses the likelihood and consequence of the impact occurring, leading to the evaluation of the significance of the impact. The role of the climate consultant in assessing the likelihood and impact is often to facilitate the climate change risk assessment process with input from the design team or specific specialists such as hydrology.

The climate screening risk assessment or vulnerability assessment is carried out by determining the sensitivity and exposure of the project to climate change. Firstly the project asset categories must be assigned a level of sensitivity to climate hazards irrespective of the project location (example: sea level rise will affect seaport projects regardless of specific location). PE-ENV-01104 (TII, 2022a) provide the below list of asset categories and climate hazards to be considered. The asset categories will vary for project type and need to be determined on a project by project basis.

- **Receptors/Assets categories** - Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.

- **Climate hazards** - Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High sensitivity:** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium sensitivity:** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low sensitivity:** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High exposure:** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium exposure:** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low exposure:** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability, as shown in **Table 12.4**.

12.2.3.2 Climate and Traffic Emissions

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO_2) which will impact climate.

The UK Highways Agency DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency, 2019) contains the following scoping criteria outlined in Section 12.1.2.2 were used to determine whether a detailed climate assessment is required for the operational stage.

There are a small number of road links that will experience a change of over 10% in the AADT during the operational phase as a result of the proposed development. As a result a detailed assessment of traffic related carbon dioxide (CO_2) emissions was conducted.

PE-ENV-01104 (TII, 2022a) states that road traffic related emissions information should be obtained from an Air Quality Practitioner to show future user emissions during operation without the development in place. The Air Quality Practitioner calculated the traffic related emissions through the use of the TII REM tool (TII, 2022d) which includes detailed fleet predictions for age, fuel technology, engine size and weight based on available national forecasts. The output is provided in terms of CO_2eq for the base year 2022, opening year 2026 and design year 2041. Both the Do Nothing and Do Something scenarios are quantified in order to determine the degree of change in emissions as a result of the proposed development. Traffic data was obtained from Waterman Moylan for the purpose of this assessment. Inputs include light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy-duty vehicles (HDV AADT), annual average traffic speeds, road link lengths,

road type and project county location. The traffic data used in the operational phase modelling assessment is detailed in Chapter 11 Air Quality (**Table 11.3).**

12.2.4 Climate Assessment Criteria

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

The significance criteria for each assessment are described below.

12.2.4.1 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development. The approach is based on comparing the '*Do Something*' scenario and the net project GHG emissions (i.e. *Do Something – Do Minimum*) to the relevant carbon budgets (Department of the Taoiseach 2022). With the publication of the Climate Action Act in 2021, sectoral carbon budgets have been published for comparison with the Net CO_2 project GHG emissions from the proposed development. The Residential Buildings sector emitted approximately 7 $MtCO_2eq$ in 2018 and has a ceiling of 4 $MtCO_2eq$ in 2030 which is a 45% reduction over this period (see **Table 12.2**).

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's (2022) '*Guidelines on the information to be contained in Environmental Impact Assessment Reports'*.

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

TII (TII 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

Significance is determined using the criteria outlined in **Table 12.3** (derived from Table 6.7 of PE-ENV-01104 (TII 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 12.3 GHGA Significance Criteria for CCRA

Effects	Significance level Description	Description
Significant adverse	Major adverse	■ The project's GHG impacts are not mitigated. ■ The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and ■ No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate adverse	■ The project's GHG impacts are partially mitigated. ■ The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and ■ Falls short of full contribution to Ireland's trajectory towards net zero.
Not significant	Minor adverse	■ The project's GHG impacts are mitigated through 'good practice' measures. ■ The project has complied with existing and emerging policy requirements; and ■ Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	■ The project's GHG impacts are mitigated beyond design standards. ■ The project has gone well beyond existing and emerging policy requirements; and ■ Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	■ The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. ■ The project has gone well beyond existing and emerging policy requirements; and ■ Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

12.2.4.1 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account. **Table 12.4** details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. Where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

Table 12.4 Vulnerability Matrix

		Exposure		
		High (3)	**Medium (2)**	**Low (1)**
Sensitivity	**High (3)**	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

12.3 Baseline Environment

12.3.1 Current Baseline

PE-ENV-01104 (TII, 2022a) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

Data published in 2022 (EPA, 2023) predicts that Ireland exceeded (without the use of flexibilities) its 2021 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 3.29 Mt CO_2eq as shown in **Table 12.5**. The sector with the highest emissions in 2021 (of total excluding LULUCF) was agriculture at 38% of the total, followed by transport at 17.7%. For 2021 total national emissions (excluding LULUCF) were estimated to be 62.11 Mt CO_2eq as shown in **Table 12.5** (EPA, 2023).

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022a) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, "*whether it* [the project] *contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

The future baseline will be determined by Ireland meeting its targets set out in the CAP23, and future CAPs, alongside binding 2030 EU targets. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted '*Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet*

commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013' (hereafter referred to as the Regulation) (European Union, 2018). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

Table 12.5 Total National GHG Emissions in 2021

Category	2021 Kilotonnes CO_2eq	% of Total GHG Emissions Excluding LULUCF	% of Total GHG Emissions Including LULUCF
Waste	943	1.5%	1.4%
Energy Industries	10,272	16.5%	14.8%
Residential	6,917	11.1%	10.0%
Manufacturing Combustion	4,624	7.4%	6.7%
Commercial Services	836	1.3%	1.2%
Public Services	659	1.1%	0.9%
Transport	10,989	17.7%	15.8%
Industrial Processes	2,477	4.0%	3.6%
F-gases	766	1.2%	1.1%
Agriculture	23,626	38.0%	34.0%
Total excluding LULUCF	62,109	100%	89%
Land use, land-use change and forestry (LULUCF)	7,338	N/A	10.6%
Total including LULUCF	69,448	N/A	100%

12.3.2 Future Baseline

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed development (EPA, 2021a):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's State of the Irish Environment Report (Chapter 2: Climate Change) (EPA, 2020b) notes that projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25% by 2030 compared with 2020 levels. Climate change is not only a future issue in Ireland, as a warming of approximately 0.8°C since 1900 has already occurred. The EPA state that it is critically important for the public sector to show leadership and decarbonise all public transport across bus and rail networks to the lowest carbon alternatives. The report (EPA, 2020b) underlines that the next decade needs to be one of major developments and advances in relation to Ireland's response to climate change in order to achieve these targets. Ireland must accelerate the rate at which it implements GHG emission reductions. The report states that mid-century mean annual temperatures in Ireland are projected to increase by between 1.0°C and 1.6°C (subject to the emissions trajectory). In addition, heat events are expected to increase by mid-century (EPA, 2020b). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020b).

TII's Guidance document PE-ENV-01104 (TII 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

Future climate predictions undertaken by the EPA have been published in 'Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach (EPA 2020a). The future climate was simulated under both Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. This study indicates that by the middle of this century (2041–2060), mid-century mean annual temperatures are projected to increase by 1 to 1.2°C and 1.3 to 1.6°C for the RCP4.5 and RCP8.5 scenarios, respectively, with the largest increases in the east. Warming will be enhanced at the extremes (i.e. hot days and cold nights), with summer daytime and winter night-time temperatures projected to increase by 1 to 2.4°C. There is a projected substantial decrease of approximately 50%, for the number of frost and ice days. Summer heatwave events are expected to occur more frequently, with the largest increases in the south. In addition, precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Climate change also has the potential to impact future energy supply which will rely on renewables such as wind and hydroelectric power. More frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

The EPA's Critical Infrastructure Vulnerability to Climate Change report (EPA, 2021b) assesses the future performance of Ireland's critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the key climate change risks with snowstorm and landslides being medium risks. Extreme winds and heatwaves/droughts are considered low risk to road infrastructure. One of the key outputs of the

research was a framework that will provide quantitative risk-based decision support for climate change impacts and climate change adaptation analysis for infrastructure.

12.4 Predicted Impacts of the Proposed Development

12.4.1 Do-Nothing Impact

In the Do Nothing scenario, the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc). The Do Nothing scenario is considered neutral in terms of the climate assessment.

12.4.2 Construction Phase

12.4.2.1 Greenhouse Gas Assessment

There is the potential for release of a number of greenhouse gas emissions to atmosphere during the construction of the proposed development.

The embodied carbon within the site clearance, construction materials (including maintenance), waste, and transport have been calculated. This calculation was based on OneClickLCA Carbon Designer Tool for Ireland for structural elements. Non-structural elements (civils i.e. drainage, road surfaces) were added via the TII online carbon tool, and the breakdown of the activities between the different phases of the proposed development were assessed. As shown in **Table 12.6**, the assessment indicates that the key sources of GHG emissions are associated with the embodied carbon of the construction materials and construction waste.

The proposed development is estimated to result in total construction phase GHG emissions of 17,154 tonnes embodied CO_2eq for the product and construction processes. This is equivalent to an annualised total of 0.43% of the 2030 Buildings (Residential) or industrial sector budgets (both have same 2030 budget) when annualised over the lifespan.

Table 12.6 Construction Stage Greenhouse Gas Emissions

Activity	Tonnes CO_2eq
Pre-Construction	2.4
Embodied Civil Carbon (Civils - Roads, Drainage etc)	1,842
Embodied Carbon (Structures)	15,269
Construction Civil Activities	12
Construction Waste	28
Total	17,154
As % of 2030 Residential Sectoral Budget	0.43%
As % of 2030 Industrial Sectoral Budget	0.43%

The proposed development is committing to reducing climate impacts, where feasible, and the development will comply with the Do-Minimum standards set through regulation – many of which are embedded design mitigations. As per the assessment criteria in **Table 12.3** the impact of the proposed development in relation to GHG emissions prior to mitigation measures being put in place is considered *short-term, adverse and significant* in EIA.

12.4.2.2 Climate Change Risk Assessment

Examples of potential climate impacts during operation are included in Annex D (Climate Proofing and Environmental Impact Assessment) of the Technical Guidance on the Climate Proofing of Infrastructure (European Commission, 2021a). Potential impacts of climate change on the proposed development include:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

Each of these potential risks are considered with respect to the operational phase of the proposed development as detailed in Section 12.4.3. During the construction phase no assessment is required, however, consideration will be given to the project's vulnerability to climate impacts. During construction, the Contractor will be required to mitigate against the effects of extreme rainfall / flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind / storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, this will require consideration during construction.

During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

In relation to climate change vulnerability, as the construction phase is not within the timescale where the worst of climate change is proposed to have occurred. The impact of the proposed development in relation to construction phase climate vulnerability emissions is therefore considered *short-term, minor adverse and not significant* in EIA terms prior to mitigation measures being put in place.

12.4.3 Operational Phase

12.4.3.1 Greenhouse Gas Assessment

There is the potential for increased traffic volumes to impact climate. The change in traffic was reviewed against the PE-ENV-01104 screening criteria outlined in Section 12.1.2.2 (TII, 2022a) and a detailed climate assessment of traffic emissions was conducted.

The predicted concentrations of CO_2 for the future years of 2026 and 2041 are detailed in **Table 12.7**. These are significantly less than the 2026 and 2041 targets set out under EU legislation (targets beyond 2030 are not available). It is predicted that in 2026 the proposed development will increase CO_2 emissions by 0.00025% of the EU 2026 target. Similarly low increases in CO_2 emissions are predicted to occur in 2041 with emissions increasing by 0.0006% of the EU 2030 target.

Table 12.7 Climate Traffic Impact Assessment

Year	Scenario	CO_2eq (tonnes/annum)
2026	Do Nothing	2,412
	Do Something	2,508
2041	Do Nothing	2,358
	Do Something	2,557
Increment in 2026		96
Increment in 2041		199
Emission Ceiling (Tonnes) 2026		37,869,352
Emission Ceiling (Tonnes) 2030		33,381,312
Impact in 2026 (%)		0.00025%
Impact in 2041 (%)		0.00060%

Note 1 Target under *Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013*

The proposed development is committing to reducing climate impacts, where feasible, and the development will comply with the Do-Minimum standards set through regulation – many of which are embedded design mitigations. As per the assessment criteria in **Table 12.3** the impact of the proposed development in relation to GHG emissions prior to mitigation measures being put in place is considered *long-term, adverse and significant* in EIA.

12.4.3.2 Climate Change Vulnerability Assessment

To determine the vulnerability of the proposed development to climate change, the sensitivity and exposure of the development to various climate hazards must first be determined. The following climate hazards have been considered in the context of the proposed development: flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning, hail, landslides and fog.

The sensitivity of the proposed development to the above climate hazards is assessed irrespective of the project location. **Table 12.7** details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per **Table 12.4**. The results of the vulnerability assessment are detailed in **Table 12.7**.

Table 12.7 Climate Change Vulnerability Assessment

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flood (coastal, pluvial or fluvial)	2 (Medium)	1 (Low)	2 (Low Risk)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low Risk)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low Risk)
Drought	1 (Low)	2 (Medium)	2 (Low Risk)
Wind	1 (Low)	2 (Medium)	2 (Low Risk)
Wildfire	1 (Low)	1 (Low)	1 (Low Risk)
Fog	1 (Low)	1 (Low)	1 (Low Risk)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low Risk)
Landslides	1 (Low)	1 (Low)	1 (Low Risk)

The proposed development has a worst-case medium vulnerability to flooding, extreme heat and extreme cold. The Site Specific Flood Risk Assessment (SSFRA) carried out by Waterman Moylan and submitted with this planning application states that the site is located in Flood Zone C with an annual probability of flooding (fluvial) and coastal of less than 0.1% AEP. All drainage and flood risk calculations include 20% climate change in accordance with Fingal County Council Requirements. This is in line with medium risk future scenarios for climate change (RCP4.5).

The Site Specific Flood Risk Assessment (SSFRA) notes that the risk from overland flooding (pluvial) from surrounding areas is low due to the finished buildings/ floor levels, being set 500mm above the top water level of the attenuation system in the 1:100 year storm and between 150mm and 300mm higher than the surrounding area. Surface water discharging from the development will be limited by a hydrobrake flow restriction device to ensure the maximum discharge rate from the site is limited to 3.7 l/s/Ha, as agreed with Fingal County Council as part of the Masterplan development.

The landscaping for the proposed development has been designed for the long term and takes account of the need for climate resilience. The Planting proposed will not require irrigation post-establishment and the species chosen have regard to the policies of the All-Ireland Pollinator Plan 2021 – 2025 as well as both the Fingal County Development Plan 2022 – 2028 and the Fingal Biodiversity Action Plan 2022 – 2030.

Extreme temperatures, both extreme heat and extreme cold, have the potential to impact the building materials and some related infrastructure. However, high quality, durable building materials will be selected for the proposed development. The building detailed design will be finalised with potential future climate hazards in mind and in accordance with:

- IS EN 1991-1-4 Windloading;
- IS EN 1991-1-7 Accidental loading;
- IS EN 1991-1- 5 Temperature loads;
- IS EN 1991-1-3 Snow loading;
- IS EN 1992 Concrete;
- IS EN 1993 Steel;
- IS EN 1996 Masonry;
- IS EN 1995 Timber.

Therefore, overall the proposed development has a worst-case medium vulnerability due to potential future flooding as a 30% allowance for climate change has not been considered to align with high-risk future scenarios (RCP8.5). All other vulnerabilities have been identified as low and therefore are not a risk. With future climate change increased heat, cold, drought or wind events are likely to occur and therefore the exposure is classed as medium.

In addition, the proposed development has been designed to reduce the impact to climate where possible (see the project Energy Statement prepared by Waterman Moylan (2023) for full details). This will primarily be through passive strategies such as an energy efficient envelope which in turn reduces the demands relating to items such as HVAC and renewable energy systems.

In relation to climate change vulnerability, it has been assessed that there is a low risk as a result of future climate change hazards. However, the above accounts for embedded design mitigation being put in place. Without this mitigation in place, the impact of the proposed development in relation to climate vulnerability emissions is considered long-term, adverse and significant in EIA terms if the final

design did not take account of climate vulnerability mitigation measures and updates to design requirements which may occur between the publication of this EIAR and the detailed design phase.

12.5 Mitigation Measures

12.5.1 Construction Phase

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. Measures to reduce the embodied carbon of the construction works include:

- Creating a construction program which allows for sufficient time to determine reuse and recycling opportunities for wastes;
- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled;
- Materials will be reused on site within the new build areas where possible;
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- Ensure all plant and machinery are well maintained and inspected regularly;
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site; and
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.

12.5.2 Operational Phase

A number of measures have been incorporated into the design of the development to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (see Section 12.3.3.2).

The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. The Energy Statement prepared by Waterman Moylan and submitted under separate cover with this planning application details a number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible. Such measures included in the proposed development to reduce the impact to climate from energy usage are:

- Achieve air tightness standards of 3 $m^3/m^2/hr$;
- Ensure thermal bridging details are designed to achieve thermal bridging factors of 0.08W/m^2K (houses) / 0.15W/m^2K (Apartments) or less;
- Meet or exceed minimum U-Value standards identified in *Part L 2022 Dwellings;*
- Provide an appropriate combination of technologies to ensure energy consumption is in line with *Part L 2022 Dwellings* requirements; and
- All in-curtilage parking spaces will be capable of being fitted with EV charging points. All off-curtilage spaces will be ducted for EV charging, with 20% fitted out from the outset.

These above identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals, relevant policies and objectives of the Fingal Development Plan 2023-2029, including climate mitigation measures. For an overview of consistency, please refer to the Planning Report prepared by BSM and submitted under a separate cover.

12.6 Residual Impacts

12.6.1 Construction Phase

The proposed development will result in some impacts to climate through the release of GHGs. TII state that the crux of assessing significance is "not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050". The proposed development is committing to reducing climate impacts, where feasible, and the development will comply with the Do-Minimum standards set through regulation. As per the assessment criteria in Table 12.3 the impact of the proposed development in relation to GHG emissions is considered *long-term, minor adverse and not significant* in EIA terms provided the final design and construction phase take account of GHG mitigation measures set out in Fingal and National Climate Action Plans.

In relation to climate change vulnerability, as the construction phase is not within the timescale where the worst of climate change is proposed to have occurred. The impact of the proposed development in relation to construction phase climate vulnerability emissions is therefore considered *short-term, minor adverse and not significant* in EIA terms provided the CEMP takes account of climate vulnerability mitigation measures.

12.6.2 Operational Phase

The proposed development will result in some impacts to climate through the release of GHGs however the projects Energy Statement aims to minimise operational phase energy requirements. TII state that the crux of assessing significance is "not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050". As per the assessment criteria in Table 12.3 the impact of the proposed development in relation to GHG emissions is considered *long-term, minor adverse and not significant* in EIA terms provided the final design and operational phase emissions take account of GHG mitigation measures set out in Fingal and National Climate Action Plans.

In relation to climate change vulnerability, it has been assessed that there is a *low risk* as a result of future climate change hazards. However, the design only takes account of an additional 20% (the medium risk (RCP4.5) scenario) with respect to flood risk, rather than 30% high risk (RCP8.5) scenario. The impact of the proposed development in relation to climate vulnerability emissions is therefore considered *long-term, minor adverse and not significant* in EIA terms provided the final design takes account of climate vulnerability mitigation measures and design requirements.

12.7 Monitoring

There is no monitoring required for the construction or operational phases.

12.8 Reinstatement

Not applicable.

12.9 Interactions

Climate has the potential to interact with a number of other environmental attributes, including Chapter 8 (Biodiversity), Chapter 9 (Land, Soils, Geology and Hydrogeology), Chapter 10 (Hydrology),

Chapter 16 (Microclimate (Daylight and Sunlight)) Chapter 17 (Traffic and Transportation) and Chapter 18 (Material Assets -Waste). Interactions occur due to the impact on the chapter from climate change occurring (i.e. biodiversity or hydrology) or due to GHG emissions being generated (i.e. Material Assets – Waste or Traffic and Transportation).

The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with a minimum 1 in 100-year event plus 20% climate change allowance. Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling. In addition, climate impacts will interact with the proposed developments design both with respect to embodied carbon but also through its vulnerability to future climate change impacts (e.g. wind loading, extreme temperatures). The building detailed design will be finalised with potential future climate hazards in mind. Building design will also take into account energy efficiency measures to reduce construction phase and operational carbon emissions. The impact of the interactions between design considerations (flood mitigation design, landscaping design and building design) and climate are considered to be *long-term* and *significant*.

12.10 Cumulative Impacts

With respect to the requirement for a cumulative assessment PE-ENV-01104 (TII, 2022c) states that *"for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable."*

However, by presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment demonstrates the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative.

In relation to climate change vulnerability, there is no significant additional risks to the Proposed Development due to cumulative developments. This includes for flood risk as the site-specific flood risk assessment takes account of the location of the site and potential cumulative impacts. In addition, there are legal requirements for the design of developments to mitigate such climate hazards. The cumulative impact of the proposed development in relation to climate vulnerability emissions is therefore considered **long-term, minor adverse** and **not significant** in EIA terms provided the final design of cumulative developments take account of climate vulnerability mitigation measures and design requirements.

12.11 Difficulties Encountered

There were no significant difficulties encountered when compiling this assessment.

12.12 References

BSI (2016) Publicly Available Specification (PAS) 2080:2016 on Carbon Management in Infrastructure

Civil Engineering Standard Method of Measurement (CESSM) (2013) Carbon and Price Book database.

Department of the Taoiseach (2022) Carbon Budgets Available at https://www.gov.ie/en/publication/9af1b-carbon-budgets/

Environmental Protection Agency (EPA) (2020a) Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach.

Environmental Protection Agency (2020b) State of the Irish Environment Report (chapter 2: climate change)

Environmental Protection Agency (EPA) (2021a) What impact will climate change have for Ireland? [Online] Available at https://www.epa.ie/environment-and-you/climate-change/what-impact-will-climate-change-have-for-ireland/

Environmental Protection Agency (EPA) (2021b) Critical Infrastructure Vulnerability to Climate Change Report no. 369

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

Environmental Protection Agency (EPA) (2023) Ireland's Final Greenhouse Gas Emissions 1990-2021

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

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

European Union (2018). Regulation 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013

European Commission (2021a) Technical guidance on the climate proofing of infrastructure in the period 2021-2027.

European Commission (2021b) Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change.

Fingal County Council & Codema (2019) Fingal County Council Climate Change Action Plan 2019 -2024

Government of Ireland (2015) Climate Action and Low Carbon Development Act

Government of Ireland (2019) Climate Action Plan 2019

Government of Ireland (2020) Draft General Scheme of the Climate Action (Amendment) Bill 2019

Government of Ireland (2021a) Climate Action Plan 2021

Government of Ireland (2021b) Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021)

Government of Ireland (2022) Climate Action Plan 2023

Government of Ireland (2023) Long-term Strategy on Greenhouse Gas Emissions Reductions

Institute of Environmental Management & Assessment (IEMA) (2010). IEMA Principles Series on Climate Change Mitigation & EIA

Institute of Environmental Management & Assessment (IEMA) (2017) Assessing Greenhouse Gas Emissions and Evaluating their Significance

Institute of Environmental Management & Assessment (IEMA) (2020a) EIA Guide to: Climate Change Resilience and Adaptation.

Institute of Environmental Management & Assessment (IEMA) (2020b) GHG Management Hierarchy. Assessing Greenhouse Gas Emissions and Evaluating their Significance

Institute of Environmental Management & Assessment (IEMA) (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance

Transport Infrastructure Ireland (TII) (TII 2021) Sustainability Implementation Plan – Our Future

Transport Infrastructure Ireland (TII) (2022a) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document

Transport Infrastructure Ireland (TII) (2022b) PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (PE-ENV-01105)

Transport Infrastructure Ireland (TII) (2022c) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document

Transport Infrastructure Ireland (2022d) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107

UK Highways Agency (2019) UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate

13 Noise & Vibration

13.1 Introduction

This EIAR Chapter has been prepared by AWN Consulting Ltd (AWN) to assess the potential noise and vibration effects of the proposed development. Full details of the proposed development can be found within Chapter 1 (Introduction). The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. In addition to specific noise and vibration guidance documents, the following Environmental Protection Agency (EPA) *Guidelines the Information to be Contained in Environmental Impact Assessment Reports* (EPA 2022) were considered and consulted in the preparation of this Chapter.

Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration impacts associated with the proposed development, during both the short-term construction phase and the long-term operational phase. The assessment of noise and vibration effects on the surrounding environment have been considered in this chapter.

Mitigation and monitoring measures are included, where relevant, to ensure the proposed development is constructed and operated in order to ensure minimal noise and vibration impacts on the receiving environment.

13.2 Method

13.2.1 Assessment Overview

The following methodology has been prepared based on the requirements of the EPA *Guidelines the Information to be Contained in Environmental Impact Assessment Reports* (EPA 2022) and on AWN's experience of preparing the noise and vibration chapters for similar developments. The following approach has been used for this assessment:

- Baseline noise monitoring has been undertaken at the development site in order to characterise the existing noise environment;
- A review of the most applicable standards and guidelines has been reviewed in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- A schedule of mitigation measures has been proposed for both the construction and operational phases to reduce, where necessary, the outward noise and vibration effects from the development.

13.2.2 Criteria for Rating of Impacts

The significance of noise and vibration effects has been assessed in accordance with the EPA 2022 Guidelines. As these guidelines do not quantify the effects in decibel terms, further reference has been made to the Guidelines for Noise Impact Assessment' produced by the Institute of Acoustics/Institute of Environmental Management and Assessment (IEMA) Working Party (2014).

With regard to the quality of the effect, ratings may have positive, neutral or negative applications. The full description of effects can be found within Chapter 1 (Introduction) of this EIAR.

13.2.3 Construction Noise Criteria

There is no published statutory Irish guidance relating to the maximum permissible noise and vibration levels that may be generated during the construction phase of a project. It is common practice to use BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 1- Noise (hereafter referred to as BS 5228-1) 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.

13.2.3.1 ABC Method

The approach adopted here calls for the designation of a noise sensitive location into a specific category (A, B or C) based on exiting ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant noise effect is associated with the construction activities. Note that, in accordance with the BS5228-1 guidance, this assessment criterion is only applicable to residential receptors.

BS 5228-1 sets out guidance on permissible noise levels relative to the existing noise environment. Table 13.1 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors.

Table 13.1 Threshold of Potential Significant Effect at Dwellings

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A[20]	Category B[21]	Category C[22]
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and weekends [23]	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

For the appropriate assessment period (i.e. daytime in this instance) the ambient noise level is determined and rounded to the nearest 5 dB. Baseline monitoring carried out as part of this assessment would indicate that noise sensitive receptors surrounding the development all lie within Category A. If the construction noise exceeds the appropriate category value, then a significant effect is deemed to occur.

The closest neighbouring noise sensitive properties to the proposed development are the Powerstown educate together and the Gaelscoil an Chuilinn, National School to the north of the development.

[20] Category A:threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

[21] Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

[22] Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

23 Category D: 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

Mulhuddart Cemetery to the east of the development. Residential properties at Ladyswell Crescent Estate to the south-east of the site and residential properties to the south west of the site at Parlickstown Drive, Wellview Estate, Wellview Park, Wellview Grove and Wellview Avenue. Other potential noise sensitive properties are located to the west of the site at the permitted development also within Church Fields (FCC Planning Ref: PARTXI/012/21).

13.2.3.2 Proposed Threshold Noise Levels

Taking into account the proposed documents outlined above and making reference to the baseline noise environment monitored around the development site (see Section 13.3.6), BS 5228-1 has been used to inform the assessment approach for construction noise.

The Construction Noise Threshold (CNT) levels within Category A are proposed for the construction stage of this development:

13.2.3.3 Interpretation of the CNT

In order to assist with interpretation of significance relating to the CNTs, **Table 13.2** includes guidance as to the likely magnitude of impact associated with construction noise, relative to the CNT. This guidance is derived from Table 3.16 of the *Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB Noise and Vibration) (UKHA 2020)* and adapted to include the relevant significance effects from the EPA 2022 Guidelines.

Table 13.2 Construction Noise Significance Ratings

Guidelines for Noise Impact Assessment Significance (DMRB)	Construction Noise Level per Period	EPA EIAR Significance Effects	Determination
Negligible	Below or equal to baseline noise level	Not Significant	Depending on CNT, duration & baseline noise level
Minor	Above baseline noise level and below or equal to CNT	Slight to Moderate	
Moderate	Above CNT and below or equal to CNT +5 dB	Moderate to Significant	
Major	Above CNT +5 to +15 dB	Significant, to Very Significant	

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at Noise Sensitive Locations (NSL's)and comment on the likely effects during the construction stage.

13.2.4 Construction Vibration Criteria

13.2.4.1 Building Response

Peak particle velocity (PPV) is commonly used to assess the structural response of buildings to vibration. Reference to the following documents has been made for the purposes of this assessment in order to discuss appropriate PPV limit values.

- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (BS7385-2), and;

- British Standard BS 5228: 2009 + A1: 2014: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (7385-2).

BS 5228-2 and BS 7385-2 advise that, for soundly constructed residential properties and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero.

The recommended vibration limits in order to avoid cosmetic damage to buildings, as set out in both documents referred to above, are reproduced in **Table 13.3.** The documents note that minor structural damage can occur at vibration magnitudes which are greater than twice those presented in **Table 13.3**. Major damage to a building structure is possible at vibration magnitudes greater than four times the values set out in the Table. It should be noted that these values refer to the vibration at the base of the building.

Table 13.3 Recommended Construction Vibration Threshold for Control of Building Damage

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:-		
Less than 15Hz	15 to 40Hz	40Hz and above
15mm/s	20mm/s	50mm/s

13.2.4.2 Human Perception

Human response to vibration stimuli occurs at orders of magnitude below those associated with any form of building damage, hence vibration levels lower than those indicated in **Table 13.3** can lead to concern. BS 5228-2 also provides a useful guide relating to the assessment of human response to vibration in terms of PPV. Whilst the guide values are commonly used to compare typical human response to construction works, they tend to relate closely to general levels of vibration perception from other general sources. **Table 13.4** summarises the range of vibration values and the associated potential effects on humans.

Table 13.4 Guidance on Effects of Human Response to PPV Magnitudes

Vibration Level, PPV	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1 mm/s	It is likely that a vibration level of this magnitude in residential environments will cause complaint.

The standard notes that single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. Where these values are routinely measured or expected then an assessment in accordance *with BS 6472 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting* (BS 6472–1) might be more appropriate to determine whether time varying exposure is likely to give rise to any degree of adverse comment.

13.2.5 Construction Phase Traffic

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network accessing the site via temporary access off of Damastown Avenue. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced: *DMRB Noise and Vibration (UKHA 2020)* and the *EPA Guidelines (EPA, 2022)*. For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the 'short term' period in accordance with the *DMRB Noise and Vibration (UKHA 2020)* document.

Table 13.5 sets out the classification of changes in noise level to impact on human perception based on the guidance contained in these documents.

Table 13.5 Classification of Magnitude of traffic noise changes for Construction Traffic

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant
3 – 4.9	Perceptible	Moderate	Slight, Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

13.2.6 Operational Phase – Additional Vehicular Traffic

Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 13.6 offers guidance as to the likely effect associated with any particular change in traffic noise level using guidance from DMRB Noise and Vibration and EPA Guidelines 2022.

Table 13.6 Likely Impact Associated with Change in Traffic Noise Level

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Long-term)	EPA Significance of Effect
0	Inaudible	No impact	Imperceptible
0.1 – 2.9	Barely Perceptible	Negligible	Not significant
3 – 4.9	Perceptible	Minor	Slight, Moderate
5 – 9.9	Up to a doubling of loudness	Moderate	Significant
10+	Doubling of loudness and above	Major	Very significant

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The

difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

13.2.7 Operational Phase – Mechanical and Electrical Services Criteria

Once a development of this nature becomes fully operational, a variety of electrical and mechanical plant will be required to service the development. Most of this plant will be capable of generating noise to some degree. Some of this plant may operate 24 hours a day, and hence would be most noticeable during quiet periods (i.e. overnight). Noisy plant with a direct line-of-sight to noise sensitive properties would potentially have the greatest impact. Plant contained within plantrooms has the least potential for impact once consideration is given to appropriate design of the space.

Good practice guidance on noise emissions from mechanical plant items would typically make reference to the British Standard BS 4142: 2014 +A1 2019: *Method for Rating and Assessing Industrial and Commercial Sound*. This document is the industry standard method for analysing building services plant noise emissions to residential receptors and is the document used commonly by local authorities in their standard planning conditions and also in complaint investigations.

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate BS 4142 assessment, it is necessary to compare the measured external background noise level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where noise emissions are found to be tonal, impulsive in nature or irregular enough to attract attention, BS 4142 also advises that a penalty be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal noise characteristics outlined in BS 4142 recommends the application of a 2 dB penalty for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

The following definitions are taken from BS 4142:

"ambient noise level, $L_{Aeq,T}$"	is the noise level produced by all sources including the sources of concern, i.e. the residual noise level plus the specific noise of mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
"residual noise level, $L_{Aeq,T}$"	is the noise level produced by all sources excluding the sources of concern, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
"specific noise level, $L_{Aeq,T}$"	is the sound level associated with the sources of concern, i.e. noise emissions solely from the mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
"rating level, $L_{Ar,T}$"	is the specific sound level plus any adjustments for the characteristic features of the sound (e.g. tonal, impulsive or irregular components);

"background noise level, $L_{A90,T}$" is the sound pressure level of the residual noise that is exceeded for 90% of the time period T.

If the rated plant noise level is +10 dB or more above the pre-existing background noise level, then this indicates that complaints are likely to occur and that there will be a significant adverse impact. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

For residential units within the proposed development, acceptable noise levels both internally and externally, can be determined by referring to the British Standard BS 8233: 2014: Guidance on Sound Insulation and Noise Reduction for Buildings. The following guidance, summarised in **Table 13.7**, is provided in this standard for internal ambient noise levels in dwellings:

Table 13.7 Guidance on Indoor Ambient Noise Levels for Dwellings

Activity	Location	Daytime (07:00 to 23:00hrs)	Night (23:00 to 07:00hrs)	Derived External Levels
Resting	Living room	35 dB $L_{Aeq, 16hr}$	--	50 dB $L_{Aeq, 16hr}$
Dining	Dining room	40 dB $L_{Aeq, 16hr}$	--	55 dB $L_{Aeq, 16hr}$
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16hr}$	30 dB $L_{Aeq, 8hr}$	50 dB $L_{Aeq, 16hr}$ (45 dB $L_{Aeq, 8hr}$ at night)

The derived external levels are based on the approximate attenuation provided by a partially open window of 15 dB, as advised in BS 8233, and represent the appropriate noise level at the external façade of the building.

13.2.8 Operational Phase – Vibration Criteria

There are no expected sources of vibration associated with the operational phase, therefore, vibration criteria have not been specified for this phase.

13.2.9 Inward Noise Impact Criteria

13.2.9.1 Fingal Development Plan 2023 - 2029

The Fingal Development Plan 2023-2029 came into effect on 5th April 2023. The development plan states the following in respect to assessing noise impacts on a proposed development.

> *"Noise assessments should follow the principles of good acoustic design in line with Professional Practice Guidance on Planning & Noise: New Residential Developments 2017 (ProPG) so that development is designed to achieve acceptable internal noise levels. Predicted internal and external noise levels should be in keeping with BSI Standards Publication BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings, Table 4: Indoor Ambient Noise Levels for Dwellings while external noise should be in accordance with Section 7.7.3.2 Design Criteria for External Noise.*

> *[…] All apartment developments should be designed as to ensure noise transmission between units and from external or internal communal areas is minimised. Guidance for noise reduction in building is set out in BS 8233:2014."*

In line with the development plans objectives and policies the relevant documents and guidance have been followed to assess the impact of noise on the proposed development.

13.2.9.2 Noise Action Plan for Fingal County 2019 – 2023

Noise Action Plan for Fingal County 2019 – 2023 (NAP) was published in September 2018. The NAP states the following with respect to assessing the noise impact on new residential development:

> *"The design and construction of buildings is regulated under the Building Control Acts 1990 to 2014 to ensure the safety of people within the built environment. The current Irish Building Regulations call for certain constructions to offer "reasonable resistance" to both airborne and impact sound. In the absence of any form of objective criteria, reference is often made to the guidance values put forward in the "Similar Construction" method described in Technical Guidance Document E."*

In the scenario where new residential development or other noise sensitive development is proposed in an area with an existing climate of environmental noise, there is currently no clear national guidance on appropriate noise exposure levels. The EPA has suggested in the interim, that Action Planning Authorities should examine planning policy guidance notes, such as ProPG (2017). Such guidance notes have been produced with a view to providing practitioners with guidance on a recommended approach to the management of noise within the planning system.

In accordance with this NAP, the following Acoustic Design Statement (ADS) has been prepared to comply with the requirements of this policy.

The NAP defines:

- Desirable low noise levels are defined as areas with a night time level less than 50 dB(A) and\or a daytime level less than 55 dB(A).
- Undesirable high noise levels are defined areas with a night time level greater than 55 dB(A) and a daytime level greater than 70 dB(A).

13.2.9.3 ProPG: Planning and Noise

The Professional Guidance on Planning & Noise (ProPG) (2017) published by the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH) is generally considered as a best practice guidance for assessing the noise risk of sites for new residential development and has been widely adopted in the absence of equivalent Irish guidance.

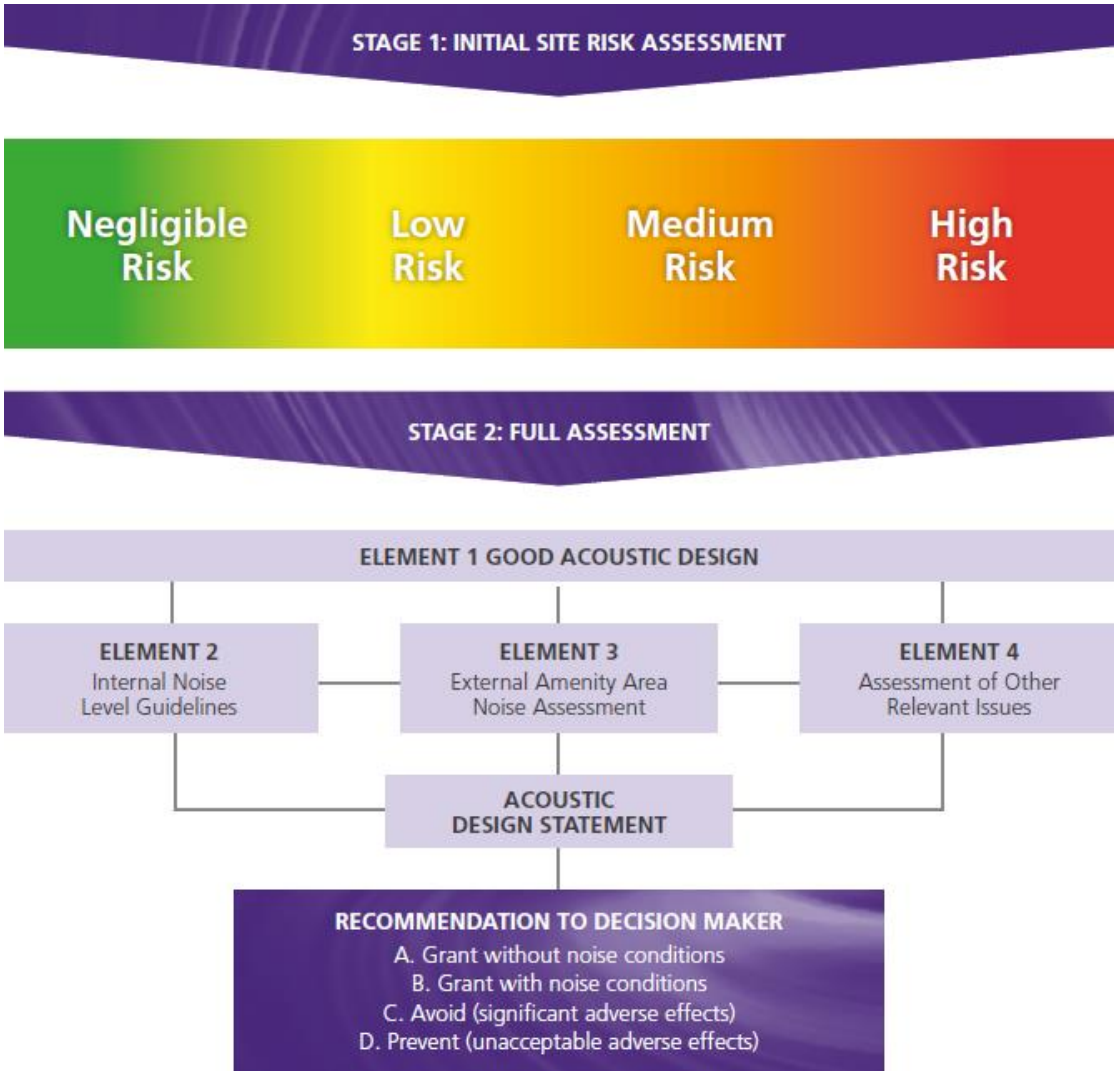
The ProPG outlines a systematic risk based 2-stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

- Stage 1 - Comprises a high level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and,
- Stage 2 is a systematic consideration of the following four elements:
  - Demonstrating a good acoustic design process;

- Observing internal noise level guidelines;
- Undertaking an external amenity area noise assessment; and
- Consideration of other relevant issues.

A summary of the ProPG approach is illustrated in **Figure 13.1**.

Figure 13.1 PropPG Approach (Source:ProPG)



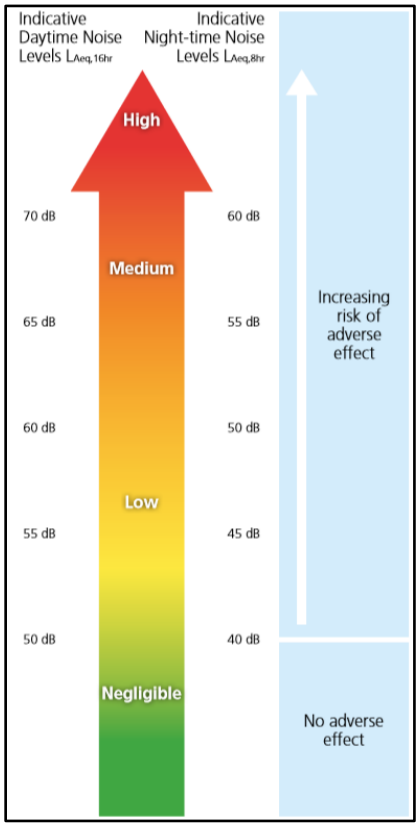
The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk based on the pre-existing noise environment. **Figure 13.2** presents the basis of the initial noise risk assessment, it provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

It should be noted that a site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times a night.

Paragraph 2.9 of ProPG states that,

"The noise risk assessment may be based on measurements or prediction (or a combination of both) as appropriate and should aim to describe noise levels over a "typical worst case" 24 hour day either now or in the foreseeable future."

Figure 13.2 Initial Noise Risk Assessment



Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233: 2014. The recommended indoor ambient noise levels are set out in **Table 13.7** above and are based on annual average data. The noise risk assessment for the site is set out in Section 13.6.3.

13.2.10 Difficulties in Compiling the Assessment

There were no significant difficulties encountered in compiling the specified information for this EIAR chapter.

13.3 Baseline Environment

The subject site is located at Church Fields East, Mulhuddart, County Dublin. The site is bound by Damastown Avenue and the Powerstown Educate Together to the North, Church Road and Mulhuddart Cemetery to the East, residential housing along Parlickstown Drive and Wellview Avenue to the south and south-west and lands with permission for future housing developments to the east. **Figure 13.3** demonstrates the proposed site layout.

Figure 13.3 Proposed Site Layout

13.3.1 Noise Survey

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with *ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise*. Specific details are set out below.

13.3.2 Choice of Measurement Locations

The measurement locations were selected to represent the noise environment at noise-sensitive locations surrounding the proposed development. The selected measurement locations are shown in **Figure 13.4** and described as follows:

- AT1 – Attended position at the Powerstown Educate Together along Damastown Avenue;
- AT2 – Attended position along the eastern boundary of the proposed site along Church Road;
- AT3 – Attended position at the residential properties along Parlickstown Drive.

Figure 13.4 Baseline Noise Survey Locations

13.3.3 Survey Periods

Attended noise measurements at locations AT 1 to AT 3 surrounding the main development site were conducted between 11:40 to 15:19hrs on 4th April 2023.

Weather conditions during the attended survey periods were dry and clear with 50% cloud cover. Temperatures were between 8°C and 13°C. Wind speeds were below 5 m/s, the maximum wind speed at which the microphone windshield is effective.

13.3.4 Personnel and Instrumentation

AWN carried out all attended surveys. The following instrumentation was used in conducting the noise surveys:

Table 13.8 Instrumentation Details

Equipment	Type	Serial Number	Calibration Date
Sound Level Meter	Rion NL- 52	164427	12/05/2022
Calibrator	B&K 4231	2460007	03/05/2022

13.3.5 Noise Measurement Parameters

The noise survey results are presented in terms of the following parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix for the noise parameters denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2 x 10^{-5} Pa.

13.3.6 Noise Survey Results

The results of the attended daytime noise surveys at AT1, AT2 and AT3 are summarised in **Table 13.9**, **Table 13.10** and **Table 13.11** . It should be noted that a logarithmic average is used for the L_{Aeq} parameter, while an arithmetic average is used for the L_{A90} parameter.

13.3.6.1 AT1

Table 13.9 Summary of attended daytime measurements at AT1

Time	Measured Level		
	$L_{Aeq,15min}$ dB(A)	$L_{Amax,15min}$ dB(A)	L_{A90}
11:40	64	77	52
12:59	65	77	52
14:23	65	77	51
Average	**65**	--	**52**

The noise environment at this location was dominated by road traffic noise from Damastown Avenue, the traffic was made up of both HGV's and light vehicles. Other noise sources that were noted during the survey period were birdsong and construction/enabling works. Ambient noise levels were in the range of 64– 65 dB L_{Aeq} while background noise levels were in the range of 51 to 52 dB L_{A90}.

13.3.6.2 AT2

Table 13.10 Summary of attended daytime measurements at AT2

Time	Measured Level		
	$L_{Aeq,15min}$ dB(A)	$L_{Amax,15min}$ dB(A)	L_{A90}
12:01	58	66	50
13:35	58	75	51
14:44	58	66	52
Average	**58**	--	**51**

The noise environment at this location was dominated by road traffic noise from Church Town Road. Other noise sources that were noted during the survey period were birdsong and distant construction/enabling works. Ambient noise levels were in the range of 58 dB L_{Aeq} while background noise levels were in the range of 51 to 52 dB L_{A90}.

13.3.6.3 AT3

Table 13.11 Summary of attended daytime measurements at AT3

Time	Measured Level		
	$L_{Aeq,15min}$ dB(A)	$L_{Amax,15min}$ dB(A)	L_{A90}
12:29	52	66	50
13:56	54	69	50
15:04	54	64	52
Average	**54**	--	**51**

The noise environment at this location was made up of distant road traffic noise as well as activity from within the housing estate such as children playing and music from adjacent properties. Other noise sources that were noted during the survey period were birdsong and occasional passing of aircraft overhead. Ambient noise levels were in the range of 52 to 54 dB L_{Aeq} while background noise levels were in the range of 50 to 52 dB L_{A90}.

13.3.7 Desktop Review of Noise Mapping

A desktop review of publicly available data has been undertaken to further characterise the baseline noise environment in the study area. Reference has been made to the most recent Round 3 noise maps published by the Environmental Protection Agency (EPA) (http://gis.epa.ie) for road traffic noise and aircraft noise within Fingal County Council. The published noise maps are provided for the overall day-evening-night period in terms of L_{den} and the L_{night} parameters, defined below.

L_{den} is the 24-hour noise rating level determined by the averaging of the L_{day} with the $L_{evening}$ (plus a 5 dB penalty) and the L_{night} (plus a 10 dB penalty). L_{den} is calculated using the following formula, as defined within the Noise Regulations:

Where:

$$L_{den} = 10log\left(\frac{1}{24}\right)\left(12 * \left(10^{\frac{Lday}{10}}\right) + 4 * \left(10^{\frac{Levening+5}{10}}\right) + 8 * \left(10^{\frac{Lnight+10}{10}}\right)\right)$$

L_{day} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the day periods of a year. The 12 hour daytime period is between 07:00hrs and 19:00hrs.

$L_{evening}$ is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the evening periods of a year. The four-hour evening period is between 19:00hrs and 23:00hrs.

L_{night} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the night periods of a year. The eight-hour night-time period is between 23:00hrs and 07:00hrs.

Figure 13.5 and **Figure 13.6** present the mapped road traffic noise levels in the vicinity of the development site as reported in the Dublin Agglomeration Noise Action Plan 2018-2023 in terms of the L_{den} and L_{night} parameters. The proposed site lies bounded by mapped roads to the East, North and South. However, the extent of the noise mapping shows that the site is only affected in relation to noise relating to the local road networks on the eastern boundary along Church Road. The levels within the site due to road noise from Church Road are noted to be 55 – 59 dB L_{den} and 50 – 54 dB L_{night}. This data is ratified through the baseline daytime survey where the measured levels on the eastern boundary at location AT2 were 58 dB $L_{Aeq,15min}$.

Figure 13.5 Mapped dB Lden Traffic Noise Level within vicinity of proposed development (Source: http://gis.epa.ie)

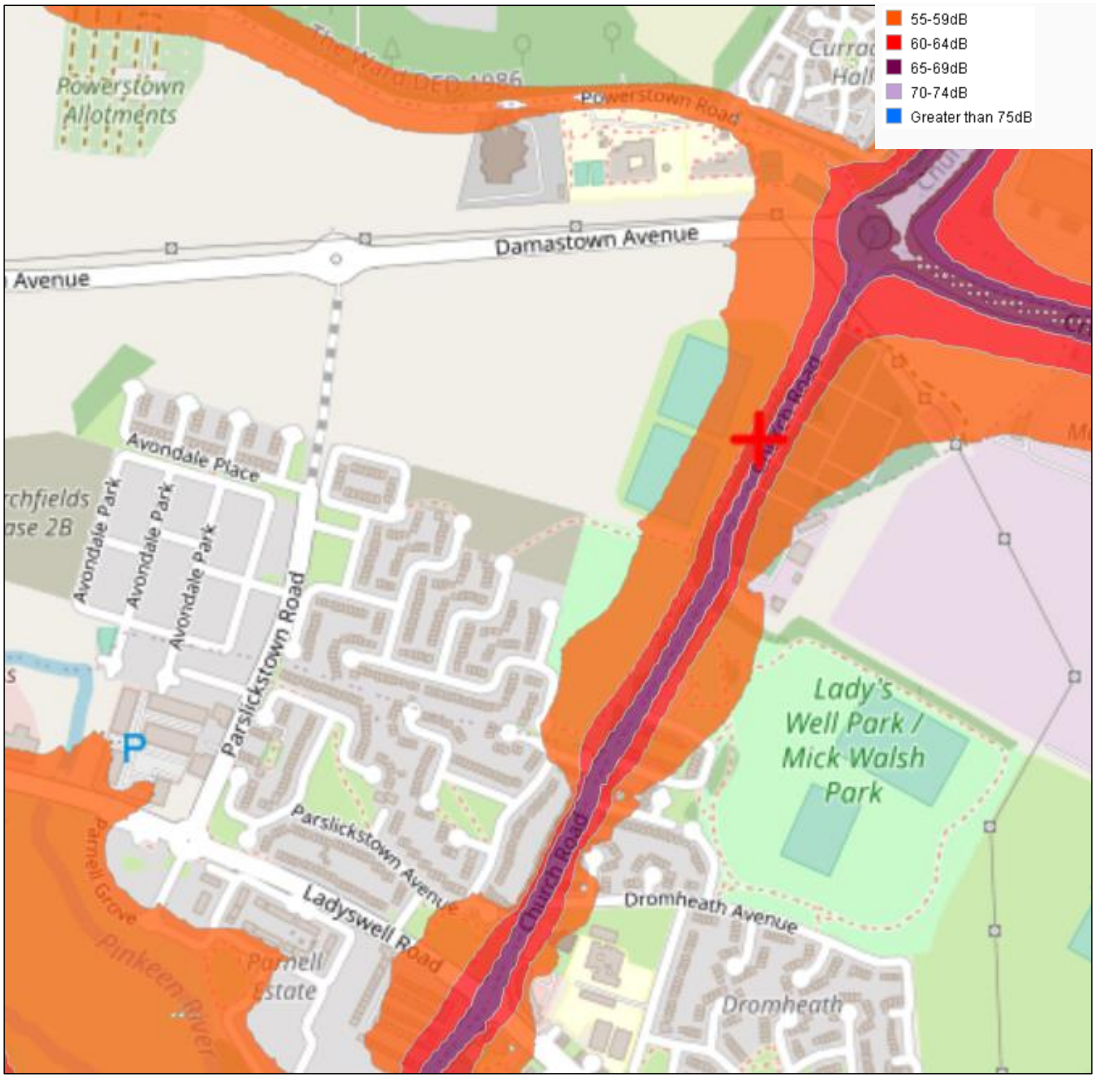


Figure 13.6 Mapped dB Lnight Traffic Noise Level within vicinity of proposed development (Source: http://gis.epa.ie)

Figure 13.7 and **Figure 13.8** present the mapped airport noise levels in the vicinity of the development site as reported in the Dublin Agglomeration Noise Action Plan 2018-2023 in terms of the L_{den} and L_{night} parameters. The proposed site lies within Airport zone D, the extent of the noise mapping shows that the site falls outside of the extent of the EPA noise map contours. The levels within the site due aircraft noise are therefore deemed not significant and through the attended baseline daytime survey were not noted to be a significant contributor to the noise environment with the main contributors to the environment noted to be in relation to road traffic.

Figure 13.7 Mapped dB Lden Airport Noise Level within vicinity of proposed development (Source: http://gis.epa.ie)

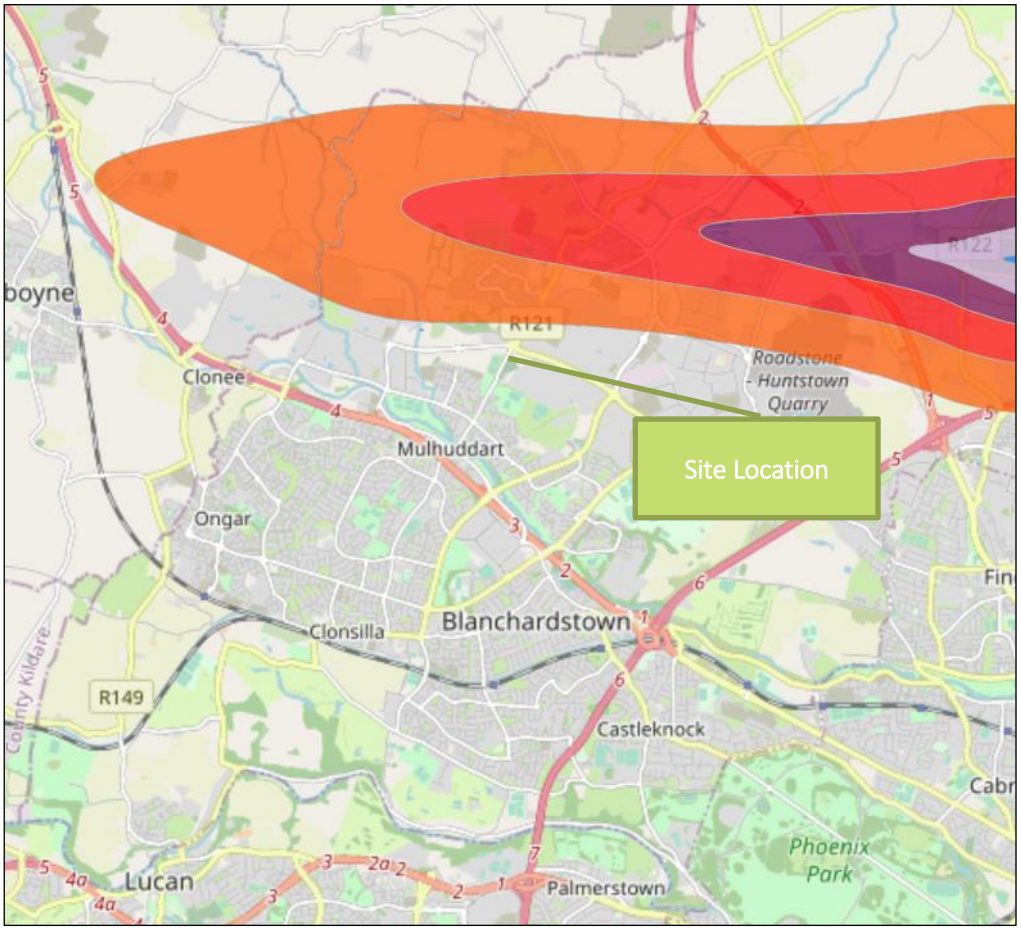
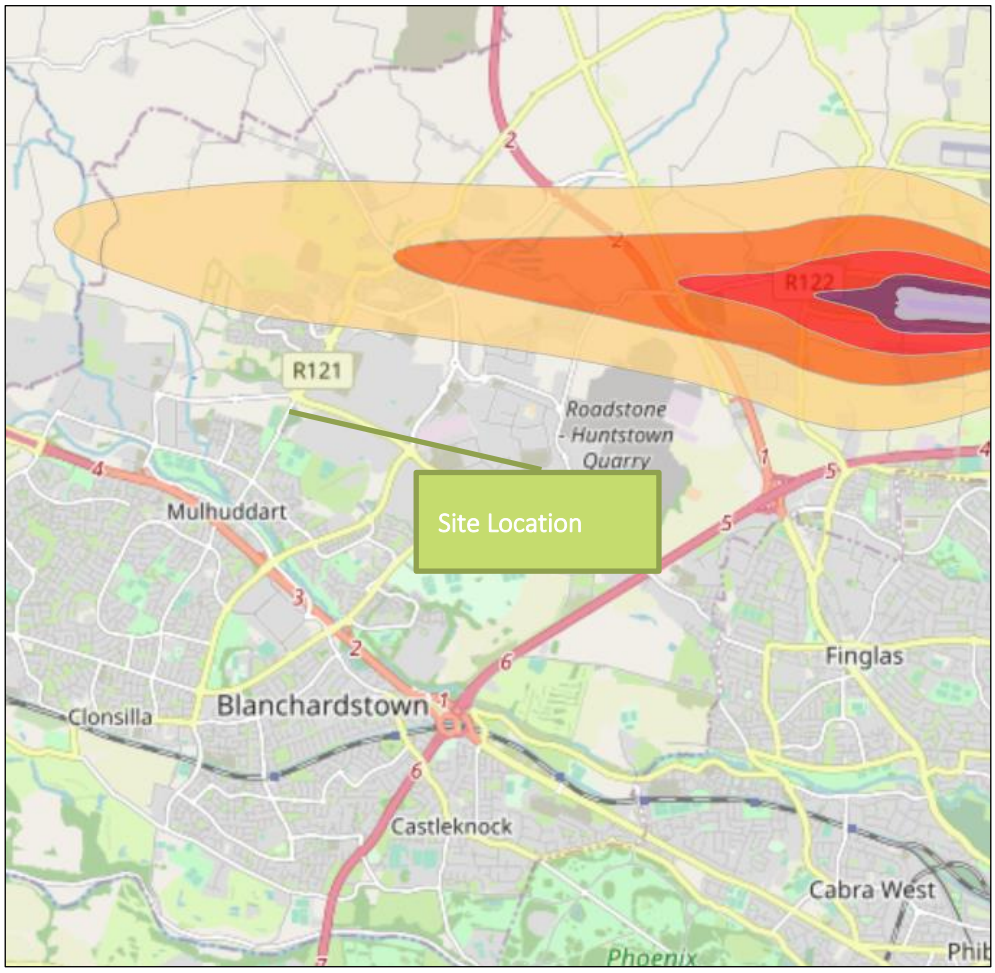


Figure 13.8 Mapped dB Lnight Airport Noise Level within vicinity of proposed development (Source: http://gis.epa.ie)



13.4 Predicted Impacts of the Proposed Development

13.4.1 Do-Nothing Impact

In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations and within the development site will remain largely unchanged resulting in a **neutral** and **local impact** in the **long-term**.

13.4.2 Construction Phase

13.4.2.1 Construction Phase – Noise

The highest potential noise and vibration impact of the proposed development will occur during the construction phase due to the operation of various plant machinery used to construct the various phases in addition to Heavy Goods Vehicles (HGVs) movement to, from and around the site. However, impacts during this phase are short-term in duration.

The nearest potential NSLs to the site are residential dwellings along the western boundary of the proposed development, at the newly permitted development within Church Fields (FCC Planning Ref: PARTXI/012/21). These permitted dwellings if operational and occupied during construction will be 20m from construction works along the western and south-western boundary of the proposed development. Other NSL's close to the construction works are the Powerstown educate together and

the Gaelscoil and Chuilinn National school to the north of the proposed development, these educational spaces are 70m from potential construction works. Residential properties to the south and south-west of the proposed development will be 150m from the construction works. Mulhuddart Cemetery to the east of the proposed whilst not strictly within the scope of BS5228 and the ABC method due to its non-residential nature is 25m to the east of the proposed development, it is advised that care is taken so as construction noise does not disturb the sensitive nature of the cemetery.

Thresholds for significant noise from construction can be determined by referring to **Table 13.1** (BS 5228-1) and the baseline ambient noise levels (Section 13.3), as outlined in the assessment criteria section. Based on the prevailing noise environment measured, the construction noise thresholds are defined from Category A. A night-time threshold is not included as construction work will not be taking place at night. **Table 13.12** outlines the thresholds for construction noise.

Table 13.12 Significance thresholds for construction noise.

Noise Sensitive Location	Period	Significance Threshold
Educational spaces to the north of site, Cemetery to the east of the site, Residential properties to the south, south-west and west of the site	Evenings and Weekends 19:00 – 23:00 weekdays 13:00 - 23:00 Saturdays 07:00 – 23:00 Sundays	55 dB $L_{Aeq, T}$
	Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65 dB $L_{Aeq, T}$

BS 5228-1 contains noise level data for various construction machinery. The noise levels relating to mobile plant, loading lorries and material handling (dozers, tracked excavators and wheeled loaders), cranes and road pavers are typically in the range of 70 to 80 dB $L_{Aeq,T}$ at a distance of 10 m. For this assessment, a combined worst-case scenario is assumed of 5 no. such items with a sound pressure level (SPL) of 75 dB at 10 m operating simultaneously along the closest works boundary has been used. This would result in a total noise level of 82 dB at 10 m and an equivalent combined sound power level of 110 dB $L_{w(A)}$.

Given the nature of the proposed works which will include standard residential house building techniques across the site, the cumulative construction noise level is considered to represent construction activities likely to be encountered during the earlier stages of construction when site clearance and any excavation works involving earth moving machinery will be employed. This worst-case scenario is a robust assumption made for developments of this size, on the basis that it is unlikely that more than 5 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other at all times. In reality items of construction plant and machinery will be operating at varying distances from any one NSL. Once the ground preparation works have been completed, a large portion of the work will involve manual labour and cranes which typically generate lower overall noise emission levels.

As noted above the closest NSL are located to the west, north, east and south of the site boundary at distances of 20 to 150m from the main site works associated with constructing the residential units. **Figure 13.9** identifies the closest NSLs external to the proposed development.

Figure 13.9 Closest NSL's in relation to proposed development

1 – Permitted development at church fields (FCC Planning Ref: PARTXI/012/21)

2 – Educational Buildings to North of site

3 – Mulhuddart Cemetery

4 – Residential buildings to south west of the proposed development

Guidance on the approximate attenuation achieved by site hoarding is also provided in BS 5228-1. It states that when the top of the plant is just visible to the receiver over the noise barrier, an approximate attenuation of 5 dB can be assumed, while a 10 dB attenuation can be assumed when a barrier blocks the line of sight between the source and receiver.

Table 13.13 presents the calculated noise levels at various distances based on the assumed sound power level. The values are calculated with the screening correction for construction site hoarding in place as standard along all boundaries and a 5 dB reduction due to the two storey nature of the surrounding buildings. Predictions are based on the utilisation of construction associated plant for a minimum of 66% of a working day (i.e. 8hrs of a 12hr day).

Table 13.13 Potential Construction Noise Levels at Varying Distances

Description of Noise Source	Sound Power Level (dB $L_w(A)$)	Calculated noise levels at varying distances (dB $L_{Aeq,T}$)							
		20m	25m	30m	50m	70m	75m	100m	150m
5 no. items with SPL of 75 dB at 10m simultaneously – with assumed 5dB screening from hoarding	110	66	63	61	56	52	51	48	44

The calculated noise levels in **Table 13.13** indicate that construction noise levels at the closest NSLs along the western boundaries will be marginally over the construction daytime significance thresholds with construction site hoarding in place. This indicates a **negative, moderate to significant** and **short term impact** at the closest noise sensitive locations along this boundary. However where this assessment is conservative it is likely that levels will be marginally lower than the predicted values. If mitigation measures outlined within Section 13.5 are followed it is likely that the effects due to construction noise will be lessened.

Construction noise levels at the other closest existing NSLs along the northern, southern, southwestern and eastern site boundaries are within the construction daytime significance thresholds with construction site hoarding in place. This indicates a **negative, slight to moderate** and **short-term impact** at the closest noise sensitive locations along these boundaries.

13.4.2.2 Construction Phase – Vibration

In terms of the potential vibration impact during the construction phase, there are no significant excavations into rock associated with this application hence no significant intrusive ground breaking or excavation work will occur. There are also no piling works forecast for the construction of the proposed development. The closest sensitive buildings to any construction works are located 20m from the development site. At these distances vibration magnitudes associated with any of the construction activities on site will be orders of magnitude below those associated with any perceptible vibration to building occupants referred to in **Table 13.4** resulting in an **imperceptible to not significant** and **temporary impact**.

All construction works are orders of magnitude below limits values associated with any form or cosmetic or structural damage to buildings or structures referred to in **Table 13.3** including any structurally vulnerable buildings.

13.4.2.3 Construction Phase – Additional Traffic on Public Roads

During the construction phase, traffic associated with the proposed development would consist of a mix of Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) travelling to and from the site. Chapter 17 (Traffic and Transportation) includes information relating to traffic generated and traffic management during this phase.

It is anticipated that during the construction phase additional traffic on the local road network will be increased by 156 extra vehicle movements during each day. With reference to the Traffic and Transport Assessment report issued by Waterman Moylan Consulting Engineers Ltd it is predicted that these extra movements will be split between a worst case 60 extra movements from LGV's and private vehicles and 96 extra movements from HGV's. Below in **Table 13.14** the additional movements in relation to construction traffic are assessed against the Do Nothing 2023 AADT traffic data.

Table 13.14 Potential Impact in relation to Construction Traffic

Road Section	Total Vehicle AADT (2023)	HGV % (2023)	Total Vehicle AADT (2023 Plus Construction Traffic)	HGV % (2023 Plus Construction Traffic)	Calculated Change in Noise Levels, dB	Significance
Junction 2 Arm A (Powerstown Road)	2,874	3%	2,905	4%	0.5	Not Significant
Junction 2 Arm B (R121)	18,119	3%	18,150	3%	0.0	Imperceptible
Junction 2 Arm C (R121)	13,872	3%	13,903	3%	0.0	Imperceptible
Junction 2 Arm D (Church Road)	11,236	2%	11,267	2%	0.0	Imperceptible
Junction 2 Arm E (Damastown Avenue)	11,583	8%	11,614	8%	0.0	Imperceptible

With reference to **Table 13.14** the resulting change in noise level due to construction traffic is likely to be **short-term, negative** and **not significant**.

13.4.3 Operational Phase

13.4.3.1 Mechanical Plant and Services

Once operational, it is understood that there are no building services plant items required to serve the residential aspect of the development. However in the event of mechanical plant being implemented to serve the residential development the cumulative operational noise level at the nearest noise external sensitive location will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods. The criteria has been selected so that the noise from items of plant does not exceed background noise levels, and hence, as per BS4142 *"this is an indication of the specific sound source having a low impact"*.

If the rated plant noise level is +10 dB or more above the pre-existing background noise level then this indicates that complaints are likely to occur and that there will be a significant adverse impact. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

Given the measured day time background levels of 51 $dBL_{A90,T}$ and the EPA noise map level in **Figure 13.5** indicating 50-54 dB L_{night}, it is proposed that the appropriate criteria for plant noise levels at the nearest sensitive noise receptors should not exceed 45 $dBL_{Aeq,1hr}$ so as to be in the region of 10dB below the background noise level and to not give rise in background noise level at the nearest noise sensitive locations. A criteria of 45 $dBL_{Aeq,1hr}$ would also align with the derived external levels within **Table 13.7** allowing for reasonable internal levels during both the day and night time periods.

The resulting impact of mechanical plant and services is likely to be **long term, negative** and **not significant.**

13.4.3.2 Additional Traffic on Public Roads

For the purposes of assessing the potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the proposed development, given that traffic from the development will make use of the existing road network.

A traffic impact assessment relating to the proposed development has been prepared as part of this EIAR within the Chapter 17 Traffic and Transportation.

Traffic flows along the surrounding road network in terms of Annual Average Daily Traffic (AADT) for the Do Minimum and Do Something scenarios have been reviewed to calculate the change in traffic noise. The calculated change in noise levels during Do Something Year (2026) and the Do Something Year (2041) are summarised in **Table 13.15** and **Table 13.16.**

Table 13.15 Potential Impact in relation to Operational Phase traffic Do Nothing 2026 v Do Something 2026

Road Section	Total Vehicle AADT (2026 Do Nothing)	HGV % (2026 Do Nothing)	Total Vehicle AADT (2026 Do Something)	HGV % (2026 Do Something)	Calculated Change in Noise Levels, dB	Significance
Junction 2 Arm A (Powerstown Road)	3,044	3%	3,056	3%	0.0	Imperceptible
Junction 2 Arm B (R121)	19,532	3%	19,756	3%	0.0	Imperceptible
Junction 2 Arm C (R121)	15,257	3%	15,529	3%	0.1	Not Significant
Junction 2 Arm D (Church Road)	11,731	2%	11,731	2%	0.0	Imperceptible

Road Section	Total Vehicle AADT (2026 Do Nothing)	HGV % (2026 Do Nothing)	Total Vehicle AADT (2026 Do Something)	HGV % (2026 Do Something)	Calculated Change in Noise Levels, dB	Significance
Junction 2 Arm E (Damastown Avenue)	13,527	8%	14,034	8%	0.2	Not Significant

Table 13.16 Potential Impact in relation to Operational Phase traffic Do Nothing 2041 v Do Something 2041

Road Section	Total Vehicle AADT (2041 Do Nothing)	HGV % (2026 Do Nothing)	Total Vehicle AADT (2041 Do Something)	HGV % (2026 Do Something)	Calculated Change in Noise Levels, dB	Significance
Junction 2 Arm A (Powerstown Road)	3,343	3%	3,355	3%	0.0	Imperceptible
Junction 2 Arm B (R121)	21,417	3%	21,641	3%	0.0	Imperceptible
Junction 2 Arm C (R121)	16,700	3%	16,971	3%	0.1	Not Significant
Junction 2 Arm D (Church Road)	12,899	2%	12,899	2%	0.0	Imperceptible
Junction 2 Arm E (Damastown Avenue)	14,731	8%	15,239	8%	0.1	Not Significant

The resultant change in noise level in relation to operational traffic of the development is likely to result in a subjectively inaudible impact. The resulting impact of operational traffic is likely to be **long term, negative** and **not significant to imperceptible**.

13.5 Mitigation Measures

13.5.1 Construction Phase

The appointed contractor will be required to take specific noise abatement measures to the extent required and comply with the recommendations of BS 5228–1 (BSI 2014a) and S.I. No. 241/2006 - European Communities (Noise Emissions by Equipment for Use Outdoors) (Amendment) Regulations 2006.

These measures will ensure that:

- During the Construction Phase, the appointed contractor will be required to manage the works to comply with the limits detailed in Section 13.2.3 using methods outlined in BS 5228–1 (BSI 2014a); and
- The best means practicable, including proper maintenance of plant and equipment, will be employed to minimise the noise produced by on-site operations.

BS 5228–1 includes guidance on several aspects of construction site practices, which include, but are not limited to:

- Selection of quiet plant;
- Control of noise sources;
- Screening;
- Hours of work;
- Liaison with the public; and
- Monitoring.

The contractor will put in place the most appropriate noise control measures depending on the level of noise reduction required during specific phases of work.

13.5.1.1 Selection of Quiet Plant

The potential for any item of plant to result in exceedance of construction noise thresholds will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever practicable (e.g. plant items with sound attenuation incorporated). Should a particular item of plant already on the site be found to exceed the construction noise thresholds, the first action will be to identify whether the item can be replaced with a quieter alternative.

The appointed contractor will evaluate the choice of excavation, breaking or other working method taking into account various ground conditions and site constraints. Where alternative lower noise generating equipment are available that will provide equivalent results, these will be selected to control noise within the relevant thresholds, where it is practicable to do so.

13.5.1.2 Noise Control at Source

The following measures will be implemented, if required, by the appointed contractor to control noise at source. These measures relate to specific site considerations:

- For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilising an acoustic canopy to replace the normal engine cover and / or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB;
- For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed;
- Where compressors, generators and pumps are located in proximity to NSLs and have the potential to exceed the construction noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation; and
- Resonance effects in panel work or cover plates can be reduced through stiffening or the application of damping compounds, while other noise nuisance can be controlled by fixing resilient materials in between the surfaces in contact.

13.5.1.3 Screening

Screening is an effective method of reducing CNLs at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver. BS 5228–1 (BSI 2014a) states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material.

Erection of localised demountable enclosures or screens will be used around piling rigs, breakers or drill bits, as required, when in operation in proximity to NSLs with the potential to exceed the construction noise thresholds. Annex B of BS 5228–1 (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on-site from standard materials. A well placed and designed mobile temporary screen around a piece of equipment or construction activity can effectively reduce noise emissions by 10 dB(A).

In addition, careful planning of the construction site layout will also be considered. The placement of site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening.

13.5.1.4 Hours of Work

Working hours will be restricted to 08:00 to 19:00 Monday to Friday & 08:00 to 14:00 on Saturdays. No Sunday or Bank Holiday work will be permitted. Out of hours working will be only permitted by arrangement with site management. Work outside of normal hours will be subject to approval by Fingal County Council

13.5.1.5 Liaison with the Public

The contractor will establish clear forms of communication that will involve the appointed contractor to NSLs in proximity to the works, so that residents or building occupants are aware of the likely duration of activities likely to generate noise or vibration that are potentially significant.

13.5.1.6 Monitoring

During the construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017).

13.5.1.7 Vibration Control

Vibration from construction activities will be limited to the values set out in **Table 13.3** to avoid any form of potential cosmetic damage to buildings and structures. Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values in **Table 13.3.**

In the case of vibration levels giving rise to human discomfort, in order to minimise such impacts, the following measures shall be implemented during the Construction Phase:

- A clear communication programme will be established by contractor to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration levels likely

to result in significant effects as per **Table 13.4**. The nature and duration of the works will be clearly set out in all communication circulars as necessary; and

- Appropriate vibration isolation shall be applied to plant (such as resilient mounts to pumps and generators), where required and where feasible.

13.5.2 Operational Phase

13.5.2.1 Building Services Noise

At the detailed design stage, best practice measures relating to building services plant will be taken to ensure there is no significant noise impact on NSLs adjacent to the development. Best practice measures in this context include the following:

- The selection and design of operational plant items with potential to emit noise to atmosphere will be designed to comply with the noise control guidance from BS 4142 (BSI 2014) as discussed in Section 13.4.3.1;
- The use of perimeter plant screens will be used, where required, to screen noise sources;
- The use of acoustic enclosures will be used, where required, for plant areas deemed to be excessively noisy during the detailed design phase to attenuate noise sources;
- The use of attenuators or silencers will be installed on external air-handling plant;
- All mechanical plant items, e.g. fans, pumps etc., shall be regularly maintained to ensure that excessive noise generated by worn or rattling components is minimised;
- Any new or replacement mechanical plant items, including plant located inside new or existing buildings, shall be designed so that all noise emissions from site do not exceed the noise limits outlined in this document; and
- Installed plant will have no tonal or impulsive characteristics when in operation.

13.5.2.2 Additional Traffic on Public Roads

Changes to traffic flows will result in a not significant increase in noise level in the surrounding environment. Therefore, no mitigation measures are necessary in this case.

13.6 Residual Impacts

13.6.1 Construction Phase

The use of best practice noise control measures, hours of operation, scheduling of works within appropriate time periods, and noise monitoring during this phase will be implemented. With the inclusion of the various noise and vibration control measures on site discussed in Section 13.5.1 it is expected that calculated noise levels in **Table 13.13** can be reduced by 5 to 10 dB.

After the implementation of mitigation measures, there is likely to be residual construction noise levels below the lower CNT of 65 dB $L_{Aeq,T}$, there is therefore potential for a **residual, negative, slight to moderate** and **temporary impact** at the NSLs along all boundaries.

The residual effect of construction vibration after the implementation of mitigation measures set out in 13.5.1 is **imperceptible, not significant and temporary.**

The residual effect of construction traffic is **short term, negative and** not **significant.**

13.6.2 Operational Phase

Once operational, residual noise levels associated with building services plant from the proposed development will be designed to not increase the prevailing background noise environment by more than 5 dB. The residual effect is **long-term, neutral, not significant**.

Traffic along the surrounding road network will not lead to a change in noise level that would pose any significant effect. The resultant impact is **long-term, negative, and not significant**.

13.6.3 Inward Impact

The development lands in question are in proximity to the EPA mapped Church Road to the east of the site (shown within **Figure 13.5** and **Figure 13.6**). Noise from the road has the potential to impact the residential developments proposed for the site itself. Particularly the apartment blocks E and F on the eastern side of the proposed development. Due to the higher daytime noise measurements undertaken at AT 1 along Damastown Avenue, particular care will also need to be taken along facades on the northern boundary of the site at both the houses bordering the north of the site and along the road facing facades of Block D.

13.6.3.1 Existing Noise Climate

The existing noise climate within the development lands was surveyed during the daytime periods and the results summarised in Section 13.3.1 of this chapter. The night time noise levels have been investigated by referring to the available EPA noise maps. The results of the survey and examination of the noise maps have indicated that highest noise levels experienced are along the eastern boundary which borders Church Road.

Dublin Airport is located approximately 6 km north-east of the Proposed Development site. The site falls into Airport Zone D. However, the significantly dominant source of noise across the development site is from road traffic. It is confirmed that once the potential impact from road traffic noise is addressed there will be no residual issue in internal residential units from aircraft noise.

In order to determine the inward noise impact for noise sensitive properties proposed as part of the development, it is necessary to determine the internal noise levels within the proposed buildings. These can then be compared against appropriate internal noise criteria from BS 8233, as summarised in **Table 13.7**.

It is possible to calculate internal noise levels within the residential properties proposed within the site, taking account of the existing and future potential noise environment, proposed constructions and the relevant sound insulation provided by the building elements (i.e. walls, roof, glazing etc.).

13.6.3.2 Stage 1: Noise Risk Classification of the Site

Using the noise measurements collected from positions AT1 and AT2 and **Figures 13.5** and **Figures 13.6** noise levels for proposed residential dwellings along the northern and eastern boundaries have been established. Road traffic noise levels measured across the eastern boundary of the site were 58 dB $L_{Aeq,16hr}$ during daytime periods and between 50 to 54dB $L_{Aeq,8hr}$ during the night time periods. It Is also a fair representation to use these levels for the northern boundary of the site bordering Damastown Avenue.

Giving consideration to the noise levels presented in the previous sections the initial site noise risk assessment has concluded that the level of risk along the eastern boundary of the site falls into the low medium noise risk category with the rest of the site falling into the low risk category.

ProPG states the following with respect to low and medium risks:

Low Risk — At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.

Medium Risk — As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.

Given the above it can be concluded that the development site may be categorised as a *Low to Medium Risk* and as such an Acoustic Design Strategy (ADS) will be required to demonstrate that suitable care and attention has been applied in mitigating and minimising noise impact to such an extent that an adverse noise impact will be avoided in the final development.

It should be noted that ProPG states the following with regard to how the initial site noise risk is to be used,

"2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design."

Therefore, following the guidance contained in ProPG does not preclude residential development on sites that are identified as having medium risk noise levels. It merely identifies the fact that a more considered approach will be required to ensure the developments on the higher risk sites are suitable designed to mitigate the noise levels. The primary goal of the approach outlined in ProPG is to ensure that the best possible acoustic outcome is achieved for a particular site.

13.6.3.3 Stage 2: Noise Assessment

Element 1 – Good Acoustic Design Process

In practice, good acoustic design should deliver the optimum acoustic design for a particular site without adversely affecting residential amenity or the quality of life of occupants or compromising other sustainable design objectives. Section 2.23 of the ProPG outlines the following checklist for Good Acoustic Design:

- Check the feasibility of relocating or reducing noise levels from relevant sources;

- Consider options for planning the site or building layout;
- Consider the orientation of proposed building(s);
- Select construction types and methods for meeting building performance requirements;
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc;
- Assess the viability of alternative solutions; and,
- Assess external amenity area noise.

In the context of the proposed development, each of the considerations listed above have been addressed in the following subsections.

Relocation or Reduction of Noise from Source

Noise sources incident upon the development site have been determined to be low to medium risk. Control of noise at source from road traffic is outside of the site boundary and hence is outside of the scope of the proposed development.

Planning, Layout and Orientation

As part of the project design, the overall majority of residential buildings within the proposed development are set back from the road boundary. The closest properties to the road will experience highest potential noise levels with reduced noise levels further into the site. The properties along the eastern boundary are orientated such that rows of residential buildings are mostly perpendicular to the road, thus reducing the number of noise sensitive facades closest to the road boundary. The buildings themselves screen the external amenity areas.

Select Construction Types for meeting Building Regulations

The design of all buildings is required to meet with all relevant parts of the Building Regulations. The specific detail of which will be completed at detailed design stage. In terms of the building sound insulation, the glazed elements and any required ventilation paths to achieve compliance with Part F of the Building Regulations will be the weakest elements in the façade.

Consideration will therefore be given to the provision of sound insulation performance for glazing and ventilation systems, where required to achieve suitable internal noise levels within the development. Achievement of acceptable internal ambient noise levels does not form part of building regulation requirements. However, this will be incorporated into the building design in line with best practice and compliance with the guidance set out in ProPG.

Impact of noise control measures on fire, health and safety etc.

The good acoustic design measures that have been implemented on site, e.g. locating properties away from the road are considered to be cost neutral and do not have any significant impact on other issues.

Assess Viability of Alternative Solutions

The main noise source incident on the site is road traffic. This source is largely mitigated by the distance to the building, screening by the on-site building and orientation of building layouts to avoid overlooking of sensitive amenity spaces to the main noise sources. All the measures listed above aid in the control of noise intrusion to the buildings across the development site.

Assess External Amenity Area Noise

ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."

Based on the prevailing noise environment, the distance of the proposed buildings from the adjacent road network, screening from proposed buildings, and the location of gardens and external amenity areas noise levels within the site, the external amenity areas are predicted to be within this range.

Summary

Considering the constraints of the site, insofar as possible and without limiting the extent of the development area, the principles of Good Acoustic Design have been applied to the development.

Element 2– Internal Noise Levels

Proposed Façade Treatment

The British Standard BS EN 12354-3: 2000: *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound* provides a calculation methodology for determining the sound insulation performance of the external envelope of a building. The method is based on an elemental analysis of the building envelope and can consider both the direct and flanking transmission paths.

The Standard allows the acoustic performance of the building to be assessed considering the following:

- Construction type of each element (i.e. windows, walls, etc.);
- Area of each element;
- Shape of the façade, and;
- Characteristics of the receiving room.

The principles outlined in BS EN 12354-3 are also referred to in BS8233 and Annex G of BS8233 provide a calculation method to determine the internal noise level within a building using the composite sound insulation performance calculated using the methods outlined in BS EN 12354-3. The methodology outlined in Annex G of BS8233 has been adopted here to determine the required performance of the building facades. This approach corrects the noise levels to account for the frequency content of road traffic noise which has been determined from the baseline survey.

Wall Construction

In general, all wall constructions (i.e. block work or concrete) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 50 dB R*w* for this construction.

Roof Construction

The sound insulation of the roof will be sufficient, provided the roof and internal linings provide an overall sound insulation performance of at least 10 dB higher than the glazing specification (see Table 10). The sound insulation of the roof construction performance shall be confirmed during the detailed

design stage. The calculated internal noise levels across the roof assuming a roof tile insulated cavity and plasterboard lining is expected to provide a minimum sound reduction index of 47 dB R*w*.

Glazing & Ventilation

As is the case in most buildings, the windows, or glazed elements, of the building envelope are typically the weakest element from a sound insulation perspective. BS 8233 is the relevant standard that applies to indoor ambient noise levels. The guidance provided in this standard is summarised in **Table 13.7** of this report. In this instance, the facades along the eastern boundary of the site (Ref **Table 13.8**) can be provided with glazing and ventilation systems that achieve the minimum sound insulation performance as set out in **Table 13.17.**

The specifications provided in **Table 13.17** are indicative and may be developed further during the detailed design stage. Alternative specifications will be acceptable provided the internal ambient noise criteria outlined in Section 13.2.9 can be achieved. As part of the detailed design of the residential blocks, the specifics in terms of octave band SRI performances will be established to take account of the finalised room layouts, room volumes and glazing dimensions.

Table 13.17 Sound Insulation performance requirements for eastern and northern facades

Minimum Sound Insulation Specification	Octave Band Centre Frequency (Hz)						Total
	125	250	500	1k	2k	4k	
Minimum Glazing Requirements	24	20	25	35	38	35	31 dB R_W
Minimum Trickle Vent Requirements	30	31	31	32	28	28	31, Dn,e,w

In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

The remainder of the site do not have a marked up acoustic rating due to the lower noise risk and hence once a standard double glazed unit which achieves a sound insulation performance of at least 30 dB R_w is achieved, no further consideration is needed to these facades. The glazing illustrated in **Figure 13.9** relate to bedrooms and living spaces. For staircore and windows to non-sensitive spaces, lower performance glazing is sufficient.

Figure 13.9 Properties with enhanced sound insulation to glazing

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing system. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

As part of the detailed design of the residential blocks, the specifics in terms of octave band SRI performances will be established to take account of the finalised room layouts, room volumes and glazing dimensions.

The residual impact is **long-term, negative, and not significant**.

13.7 Monitoring

13.7.1 Construction Phase

During the construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017).

13.7.2 Operational Phase

There are no proposed monitoring requirements associated with the operational phase of the proposed Development.

13.8 Reinstatement

Not Applicable

13.9 Interactions

In compiling this impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and traffic flow projections associated with the development provided by the traffic consultants within Chapter 17 (Traffic & Transportation). Other potential interaction between noise and vibration and other specialist chapters in the EIAR are primarily limited to Chapter 7 (Population & Human Health), Chapter 8 (Biodiversity).

13.10 Cumulative Impacts

13.10.1 Construction Phase

A full list of developments that are currently permitted or under construction within the surrounding area are identified and described in Section 21.4, of Chapter 21 (Cumulative Impacts).

In the event that construction activities at nearby sites are taking place concurrently with construction of the proposed development, there is potential for cumulative noise impacts to occur. Due to the nature of construction works associated with the proposed development, noise levels from this site will dominate the noise environment when occurring in proximity to the noise sensitive locations along its immediate boundary. The noise contribution from other construction sites would need be equal to those associated with the proposed development in order to result in any cumulative effect.

In the event of the two construction phases of the proposed development overlapping, predicted construction noise levels within Section 14.4.2 will rise by the order of +3 dB.

13.10.2 Operational Phase

The noise limits set within the EIAR are designed to avoid any significant increase in the prevailing background noise environment. There is not expected to be a cumulative effect in relation to either the mechanical plant noise or road traffic noise during the operational phase of the proposed development

13.11 Difficulties Encountered

No difficulties encountered.

13.12 References

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022);
- British Standard Institute (BSI) British Standard (BS) 5228-1:2009 +A1 2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (BSI 2014a);
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (BSI 2014b);
- BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (BSI 1993);
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (BSI 2008);
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BSI 2014c);
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (BSI 2019);
- BS EN 12354-3: 2000: Building Acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3 Airborne sound insulation against outdoor sound;
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (UKHA 2020);
- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018;
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- International Organization for Standardization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (ISO 1996);
- ISO 1996-1: 2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (ISO 2016);
- ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (ISO 2017);
- Noise Action Plan for Fingal County Council (2019-2023)
- Fingal Development Plan (2023-2029)
- The UK Department of Transport Calculation of Road Traffic Noise (UK Department of Transport 1998) and;
- ProPG: The Professional Guidance on Planning & Noise (ProPG) (2017) (Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)).

14 Landscape & Visual

14.1 Introduction

The purpose of this report is to describe the landscape and visual effects of a proposed residential development at Church Fields Mulhuddart, Dublin 15. The proposed development will consist of the construction of 217 no. residential units (ranging from 2 – 4 storeys in height) in a mixed tenure development, comprising of 121 no. houses and 96 no. apartments. The location of the proposed development is shown on Figures 1.1 and 1.2 (Chapter 1).

A detailed description of the proposed development is provided in Chapter 5 of this EIAR. The following have been reviewed / are specifically referenced in this landscape and visual assessment:

- Other chapters of the EIAR, especially Chapter 5 Project Description, Chapter 8 Biodiversity, Chapter 15 Cultural Heritage, Archaeology & Architectural Heritage and Chapter 21 Cumulative Impacts.
- Architectural, Engineering and Landscape Drawings of the Proposed Development;
- Architectural Design Statement (Walsh Associates, 2023);
- Planning Report (BSM, 2023);
- Landscape Design Statement (BSM, 2023) and
- Photomontages of Proposed Development (BSM, 2023).

This assessment has been prepared by Thomas Burns, B.Agr.Sc. (Landscape), Dip EIA Management; Ad. Dip. Planning & Environmental Law; MILI, MIELA. Thomas is a Partner and Landscape & Environmental Planner with Brady Shipman Martin environmental, landscape and planning consultants and has over 30 years' experience in landscape and environmental planning issues including in the preparation of landscape and visual impact assessments.

14.2 Method

The assessment is based on the methodologies set out in the following guidelines:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022);
- Guidelines for Landscape and Visual Impact Assessment 3rd edition (Landscape Institute and the Institute of Environmental Management and Assessment [IEMA] 2013); and
- Technical Information Note 05/2017 (Revised 2018) on Landscape Character Assessment (Landscape Institute 2018).

The EPA Guidelines (EPA 2022) provide a general methodology, including impact ratings and assessment structure, which is applicable across all environmental assessments. The GLVIA (Landscape Institute and IEMA 2013) provides specific guidance for landscape and visual impact assessments. The TCA (Landscape Institute 2018) is a resource for the application of landscape character assessment to landscapes. Therefore, in this assessment, a combination of the approaches outlined in the EPA Guidelines (EPA 2022) and in the GLVIA (Landscape Institute and IEMA 2013), supported by the TCA (Landscape Institute 2018) and the professional experience and expertise of the assessor, is utilised in the landscape and visual assessment.

14.2.1 Key Definitions

The following key definitions are relevant to the methodology for the landscape and visual impact assessment:

Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors' (European Landscape Convention 2000)'. As such landscape can be taken to embrace built areas including towns and cities.

Landscape Character Assessment is the process of identifying and describing variation in the character of the landscape. It seeks to identify and explain the unique combination of elements and features (characteristics) that make landscapes distinctive' (Natural England 2014).

Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right, and on people's views and visual amenity' (Landscape Institute and IEMA 2013)

Landscape Impact vs. Landscape Effect - 'Impact' is defined as the action been taken, whilst 'effect' is defined as result (change or changes) of that action, e.g. the 'impact' of the Proposed Development on the woodland has a significant 'effect' on the character of the landscape.

14.2.2 Data Collection and Collation

Data collection and collation is based on initial desk studies, supported by site walkovers, which allow for identification of designated and potential significant / sensitive areas, involved a review of:

- Fingal Development Plan 2023 – 2029 (FDP, 2023);
- Historical and current mapping and aerial photography of the area (e.g. ordnance survey Ireland, google earth, google maps);
- Plans and details of the Proposed Development; and
- Other reports and documents relating to the receiving environment.

Site-based studies allow for verification of desk study findings and for analysis of current conditions in the baseline environment.

14.2.3 Appraisal Method for the Assessment of Impacts

Assessment of impacts on the landscape and visual aspects has regard to a combination of approaches as outlined in the EPA Guidelines (EPA 2022) and in the GLVIA (Landscape Institute and IEMA 2013), supported by the TCA (Landscape Institute 2018) and the professional experience and expertise of the author.

A matrix showing the relationship between sensitivity, magnitude and effect significance as per Figure 3.4 in the EPA Guidelines (EPA 2022) is shown in **Figure 14.1** Landscape and Visual Impact Assessment Criteria.

The assessment is supported by the preparation of a series of Photomontages (BSM, 2023). For each location a 'Baseline' view and as 'Proposed' view is provided.

14.2.4 Methodology for Assessment of Landscape and Visual Effects

Assessment of potential landscape effects involves:

- Classifying the sensitivity of the receiving environment of the landscape resource; and

- Describing and classifying the magnitude of change in the landscape resulting from the Proposed Development.

These factors are combined to provide a classification of significance of landscape impacts of the Proposed Development.

Assessment of potential visual effects involves identifying key / representative viewpoints in the baseline environment of the Proposed Development, and for each of these:

- Classifying the viewpoint sensitivity; and
- Classifying the magnitude of change in the view.

These factors are combined to provide a classification of significance of visual impacts of the Proposed Development.

14.2.5 Methodology for Assessment of Landscape and Visual Sensitivity

The sensitivity of the landscape and visual environment is a function of its existing land use, patterns and scale, enclosure, visual characteristics and value. The nature and scale of the Proposed Development is taken into account, as are trends of change and the relevant landscape / visual policy framework. Four categories are used to classify landscape and visual sensitivity as set out in **Table 14.1**.

Magnitude of change is derived from the scale, extent and degree of change imposed on the landscape and visual environment by the Proposed Development, with reference to its key elements, features and characteristics and the surrounding character areas. Four categories are used to classify magnitude of change as set out in **Table 14.1**.

Table 14.1 Landscape / Visual Assessment: Sensitivity and Magnitude of Change

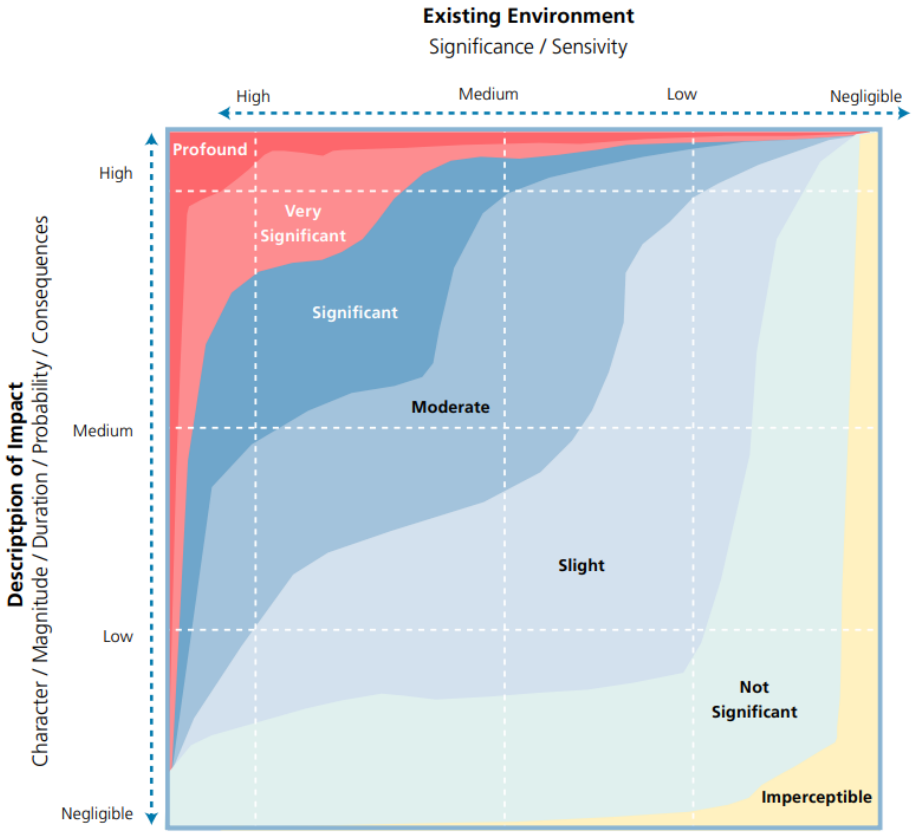
Description of Baseline Sensitivity	Description	Description of Magnitude of Change arising from Proposed Development
Landscapes / views that are recognised in policy and / or through designation. The composition, character and quality of the landscape / view are such that its capacity to accommodate change is very low. The principle management objective for the landscape / view is the protection of its existing character / visual quality.	High	Change that is large in extent, resulting in the loss, or major alteration of critical or key elements, features or characteristics of the landscape / view, or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character, value and quality of the landscape / view.
Landscapes / views that have features or characteristics of acknowledged value, which provide landscape value / visual amenity and have no major detracting elements. These landscapes / views may have capacity for appropriate change and the principle management objective is to allow appropriate change that does not detract from landscape value / visual amenity, or which enhances them.	Medium	Change that results in partial loss or alteration to key elements, features or characteristics of the landscape / view, and / or introduction of elements that may be prominent but not necessarily uncharacteristic in the context. Such development results in change in the character, value and quality of the landscape / view, but without fundamental alteration.
Landscapes / views that have no valued feature or characteristic, and where the	Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements,

Description of Baseline Sensitivity	Description	Description of Magnitude of Change arising from Proposed Development
composition and character are such that there is capacity for change. For such landscapes / views the principle management objective is to facilitate or promote change that does not detract from landscape value / visual amenity, or enhances them.		features or characteristics of the landscape / view, and / or introduction of elements that are not uncharacteristic in the immediate or wider context. Such development results in minor change in the character, value and quality of the landscape / view.
Landscapes / views that have no valued feature or characteristic, or in which the composition may be unsightly (e.g. in derelict landscapes). For such landscapes / views the principle management objective is to actively promote change that repairs, restores or enhances landscape value / visual amenity.	Negligible	Change that is limited in scale, resulting in no alteration to key elements features or characteristics of the landscape / view, and / or introduction of elements that enhance the characteristics of the context. Such development results in no change in – or improves the character, value and quality of the landscape / view.

14.2.6 Significance of Effects on the Landscape / Visual Environment

In classifying the significance of impacts the magnitude of change is assessed against the sensitivity of the landscape / view based on Figure 3.4 in the EPA Guidelines (EPA 2022) as presented in **Figure 14.1**.

Figure 14.1 Classification of Significance of Landscape and Visual Impacts



Descriptions of the significance of effect (i.e. Negligible to Profound) as per **Figure 14.1** above are as provided in Table 3.4 of the EPA Guidelines (EPA, 2022) and in **Table 14.2** below.

Table 14.2 Description of Significance of Effects

Significance of Effect (Refer to Figure 14.1)	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 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.

14.2.7 Quality and Duration of Effects

An impact assessed as being significant may be either positive, neutral or negative. For example, the introduction of a new structure may represent a significant change with an associated significant impact. However, the effect of the significant impact may be positive, in that structure enhances the landscape or visual quality of the receiving environment; may be negative in that it detracts from the receiving environment; or may be neutral in that despite the significant change, any negative and positive aspects are balanced or cancelled.

The potential for significant neutral impacts is particularly noted over time, where a development or structure may be increasingly accepted as part of the receiving landscape / view.

As such this will involve a degree of subjectivity. This is because visual amenity is perceived by people and therefore, is subject to variations in the attitude and values, including aesthetic preferences of the receptor. One person's attitude to the Proposed Development may differ from another person's, and thus their response to the effects on the landscape or a view may also vary.

Furthermore, in certain situations a policy may encourage or support a particular development in an area, in which case the policy is effectively prescribing a degree of landscape and visual change. If the Proposed Development achieves the objective of the policy the resulting effect might be considered positive, even if existing landscape character or views are significantly altered. The classification of quality of landscape and visual effects seeks to take these variables into account and provide for a rational and robust assessment.

Therefore determining the significance of impacts that are rational and justifiable is also based on the professional judgement, expertise and experience of the author.

14.2.8 Relevant Legislation, Policy and Guidelines

The assessment has been carried out with reference to the following legalisation, policy and guidelines:

14.2.8.1 Legislation

- Planning and Development Acts 2000 - 2023;
- Planning and Development Regulations 2001-2023; and
- European Landscape Convention 2000.

14.2.8.2 Policy

- Fingal Development Plan 2023 – 2029 (FDP, 2023).

14.2.8.3 Guidelines

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Guidelines for Landscape and Visual Impact Assessment 3rd edition (Landscape Institute and the Institute of Environmental Management and Assessment [IEMA] 2013); (GLVIA, 2013); and
- Technical Information Note 05/2017 (Revised 2018) on Landscape Character Assessment (Landscape Institute 2018) (TCA, 2018).

14.3 Baseline Environment

14.3.1 Planning and Policy Context

The site for the proposed development is located in the peri-urban Tyrrelstown area north of Mulhuddart Dublin 15, c.11.5km to the north-west of Dublin city centre and c.1.5km north of Blanchardstown town centre.

The development site is located between a stand of mature tree along Church Road to the east, the permitted Church Fields Housing and Eastern Linear Park Development (PARTXI/012/21) to the west, Damastown Avenue to the north, and a permitted linear park (PARTXI/012/21) to the south. The protected structure of Mulhuddart Church (in ruins) and Graveyard (RPS No. 670) is located east of Church Road. Further to the south-west of the proposed development site are the existing residential areas of Avondale and Wellview (refer to **Figure 14.2**).

Further to the north of the Damastown Avenue the lands are in community use comprising of Betania Church and Powerstown Educate Together National School, and Gaelscoil an Chuilinn educational facilities. Tyrrelstown local centre is c. 750m to the north-east of the proposed development. Lady's Well Park, to the east of Church Road is c. 100m to the south-east of proposed development site. The TU Dublin Blanchardstown Campus is a further c. 720m to the south-east. Further to the north-east are the Amazon Data Centre Technology Park, Pharmaceutical facilities, Blanchardstown Corporate Park, Northwest Logistics and Business Park and, Ballycoolin Business Park, while to the south-west is the Damastown Industrial Park and Plato Business Park comprising light industrial and pharmaceutical activities.

The site is effectively green-field, currently used in-part as amenity space and in-part as rough grassland with scrub and some areas of spoil and rubble. There are no existing structures on the site. While a

110kV overhead powerline crosses the north-eastern corner of the site, the associated pylons are located outside of the site – north of Damastown Avenue and east of Church Road.

An earth bank runs from south to north and then east through the western and northern part of the site. A treeline and hedgerow with associated scrub runs along the west – east section of the bank. There are no watercourses within the site, however, the Pinkeen River flows north to south c. 800m west of site.

A new footpath and cycleway facility is currently under construction along the eastern boundary of the site. East of the cycleway lies a stand of mature mainly beech trees framing the west side of Church Road.

A cycleway, permitted as part of the Church Fields Link Road and Cycle Network Project (FCC Planning Ref. No.: PARTXI/011/19), is under construction along the eastern boundary of the site and west of the mature trees along Church Road (refer to Figure 14.2).

The lands are overlooked from Damastown Avenue to the north and from existing residential areas in Wellview to the south/south-west. The site also adjoins permitted residential development to the west (construction due to commence later in 2023).

A Tree Survey and Planning Report (Independent Tree Surveys, 2023) has been carried out for the site. The report notes that the most significant trees in the area are the line of mature Beech trees (Group G3) along the western side Church Road. These trees are outside of the site boundary. There are 2 main groups of trees within the site (G1 & G2) comprising mature Hybrid Black Poplar (G1) and a second mixed planting of younger trees and shrubs (G2). The trees within G1 are tall and have some local amenity and landscape value. There are also some areas of regenerating planting with young oak saplings within the site. An old hedgerow (H1), which lies south of the site will be incorporated into the previously permitted Eastern Linear Park (FCC Reg. Ref. No.: PARTXI/012/21). In addition, a line of young fastigate hornbeam trees have been planted in the verge along Damastown Avenue to the north.

Figure 14.2 Site Context

14.3.2 Planning and Policy Context

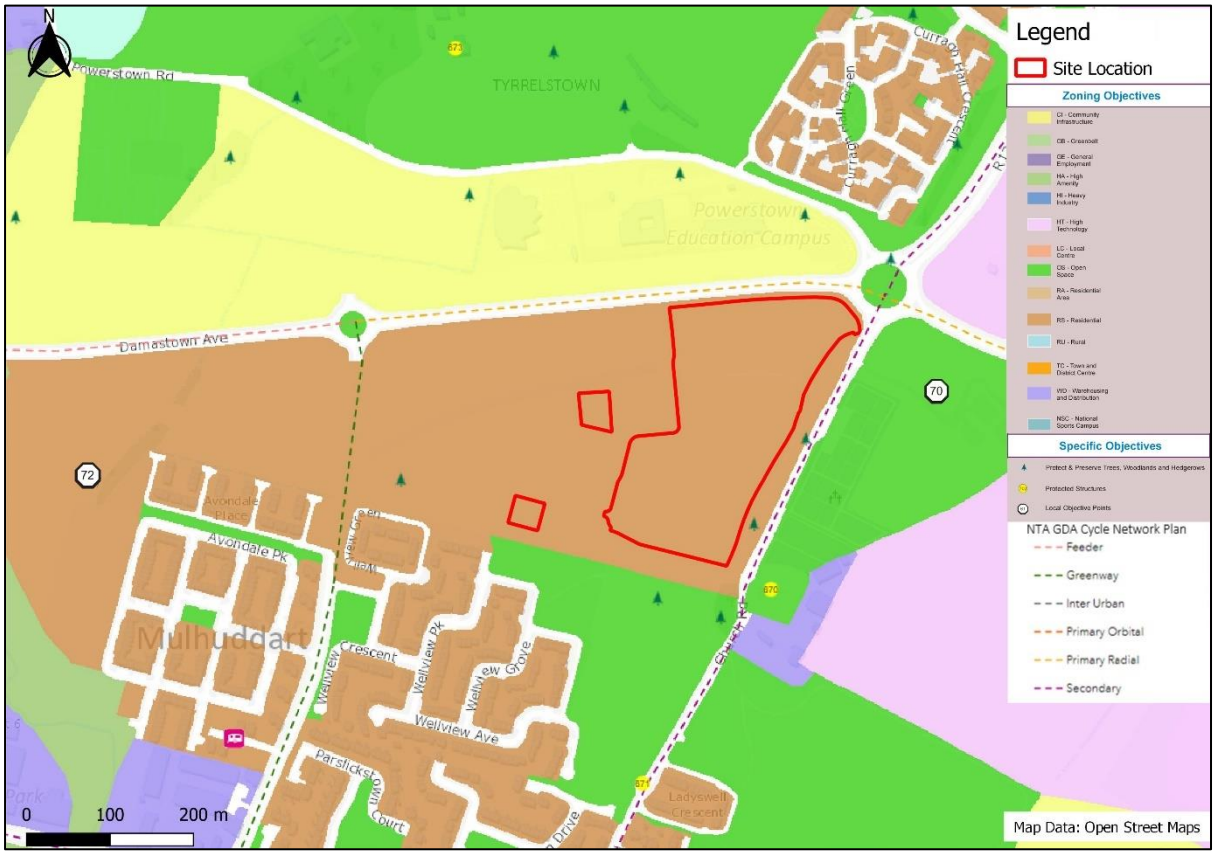
The site and adjoining lands, including existing residential areas in Wellview and Avondale to the south are zoned '**RS – Residential**: To provide for residential development and protect and improve residential amenity' (refer to **Figure 14.3**). Surrounding zonings include:

- **CI - Community Infrastructure**: Provide for and protect civic, religious, community, education, health care and social infrastructure.
  This applies to the lands to the north of Damastown Avenue.
- **OS - Open Space**: Preserve and provide for open space and recreational amenities.
  This applies to existing open space areas at Wellview Park to the south, Lady's Well Park to the south-east, to areas (including the Mulhuddart Cemetery and Graveyard) to the east of Church Road, to small areas within existing residential areas and around Tyrrelstown House to the north of Damastown Avenue.
- **GE – General Employment**: Provide opportunities for general enterprise and employment.
  This applies to an existing area south-east of historic Mulhuddart Church (in ruins) and Graveyard.
- **HA – High Amenity**: Protect and enhance high amenity areas.
  This applies to the valley of the Pinkeen River over 800m to the west of the site. The Pinkeen Valley is also an area of Highly Sensitive Landscape and the immediate river corridor is subject to local flooding.
- **HT – High Technology**: Provide for office, research and development and high technology/high technology manufacturing type employment in a high quality built and landscaped environment.
  This applies to a large area to the north-east of the site and east of the Mulhuddart Cemetery.

Additional land use aspects of relevance (refer to **Figure 14.3**) include:

- **Protected Structures**: Mulhuddart Church (in ruins) and Graveyard (RPS No. 670) and Mulhuddart Holy Well / Lady's Well (RPS No. 671). These structures are also National Monuments (SMR No. DU013-010001 / DU013-010003 & SMR No. DU013-009 respectively).
  These structures are located east of Church Road and further south along Church Road south of the site.
- **Local Objective 72**: Provide for adequate screening and separation of new development from the residential housing adjoining to the south.
  A previously permitted Eastern Linear Park (PARTXI/012/21) – Class 1 open space, which incorporates planting and screening – is located south of the proposed residential development site.
- **Specific Objective**: Protect & Preserve Trees, Woodlands and Hedgerows.
  This does not apply to any vegetation on the site. However, it does apply to the existing mature trees along Church Road east of the site and within the open space south of the site.
- **Landscape Character**: The site is located within the River Valleys / Canal Landscape Character Type.

Figure 14.3 Land Use Zoning and Objectives



14.4 Predicted Impacts of the Proposed Development

14.4.1 Do-Nothing Impact

The lands at Church Fields are zoned for residential and associated open space development. Therefore, should this development not proceed, it is envisaged that some development of a broadly similar nature and environmental effect will proceed on these lands at some stage in the future.

14.4.2 Construction Phase

The Construction Phase of the Proposed Development will see the continuation of planned construction works at the permitted Church Fields Housing and Eastern Linear Park project (FCC Reg. Ref. No.:PARTXI/012/21) located to the immediate west of the site. This will involve: -

- Temporary fencing for security and for protection of hedgerows / tree-lines (close to but outside of the site boundary).
- Provision of a temporary Site compound within the development footprint.
- Topsoil stripping and temporary storage for re-use.
- Subsoil excavation and removal from Site.
- Removal of Groups G1 and G2 existing trees.
- Replanting of selected young oak trees to proposed open space areas to east of proposed housing.
- Grading and preparation of the Site for construction works.
- Construction of roads, houses, apartments, installation of services, etc.
- Minor upgrade works to previously permitted surface water infrastructure within two open space areas of the Church Fields Housing and Eastern Linear Park (FCC Reg. Ref. No.: PARTXI/012/21).
- Construction of pocket park and open spaces and links to permitted Eastern Linear Park to south.
- Tree planting in streets, open spaces, and on northern boundary with Damastown Avenue.
- Provision of timber knee-rail and hedgerow boundary along Damastown Avenue (to match previously permitted detail on lands to immediate west.

Potential for landscape and visual impacts from the Construction Phase is associated with: -

- Site-based landscape disturbance, earthworks, stockpiling of soils and materials.
- Removal of trees / vegetation.
- General construction activity and traffic.
- Construction of new houses and apartment blocks and associated site development works.
- Inconvenience and / or visual effects from dust, dirt, noise.

The site for the proposed development is relatively confined, in effect bounded by public roads to the north and east and by permitted residential and open space development to the west and south. The permitted development is due to commence construction later in 2023. Permitted infrastructure is also under construction at present in the form of road and cycleway networks works and in small scale residential development within Wellview and Avondale to the south / south-west. Therefore, the proposed development will be viewed as a continuation of on-going construction works leading towards completion of residential development and associated works in the eastern area of Church Fields.

Construction works at the site are similarly confined and construction compound will be located within the development footprint with a temporary construction access off Damastown Avenue.

The removal of existing trees within the site (mainly Groups G1 and G2) will have a localised Moderate, Negative but Temporary effect. The significant stand of Beech trees along Church Road will be unaffected.

The receiving environment is of Low to Medium sensitivity and the degree of change associated with the construction stage is Medium. Therefore, the landscape and visual impact of the construction phase is assessed as being **Moderate, Negative** and **Short-term**.

14.4.3 Operational Phase

The Operational Phase of the Proposed Development will see delivery of a further phase of residential development and an expansion of the existing and emerging residential community at Wellview / Avondale and Church Fields in accordance with the land use zoning and Church Fields Site Strategy for the lands.

Together with the completion of the permitted Church Fields Housing and Eastern Linear Park (FCC Reg. Ref. No.: PARTXI/012/21), the Operational Stage of the proposed development will complete the development within the eastern portion of the wider Church Fields lands, delivering an overall 517no. residential units, and key open spaces in the form of a Class 1 Eastern Linear Park and extended open space network.

The Operational Phase of the Proposed Development will involve: -

- Completion of 217no. residential units (in additional to the 300no. previously permitted), with extended community within the Church Fields East development area.
- Access to the previously permitted Eastern Linear Park and to an expanded public open network of spaces.

Potential landscape and visual impacts from the Operational Phase are associated with:

- Design, character and quality of proposed buildings.
- Design, amenity and quality of proposed open spaces.
- Overall quality of finish and management of development.

On completion the new development will establish its presence on the environmental, physical and visual character of its environs. In this regard landscape and visual impacts must also be considered within the context of existing, permitted and, emerging developments in the area. The proposed development is being provided in accordance with the approach, layout and principles established in the previously permitted Church Fields Housing and Eastern Linear Park development (FCC Reg. Ref. No.: PARTXI/012/21). The proposed development also provides for extended network of open space including links to the permitted Eastern Linear Park.

The receiving environment is of Low to Medium sensitivity and the degree of change associated with the construction stage is Medium. Therefore, the landscape and visual impact of the construction phase is assessed as being Moderate, Neutral and Long-term.

14.5 Mitigation Measures

14.5.1 Construction Phase

Mitigation measures are proposed to avoid, reduce or remediate, wherever possible significant negative landscape and visual effects of the construction phase of the Proposed Development. In addition to the operation and management of all construction works in accordance to best methodologies and practice, that following measures are proposed for the mitigation of landscape / townscape and visual impacts: -

- Construction works will be guided by a Construction Environmental Management Plan (CEMP), which shall provide the environmental management framework to be adhered to and monitored during the pre-commencement and construction phases of the Proposed Development. The CEMP

will incorporate all of the mitigating principles required to ensure that the work is carried out in a way that minimises the potential for environmental impacts to occur.

- Construction compounds will not be located within the root protection area of trees or hedgerows to be retained and will be enclosed by solid hoarding. The compound areas will be fully decommissioned and reinstated at the end of the construction phase.
- Trees, hedgerows and vegetation to be retained within and adjoining the works area will be protected in accordance with 'BS 5837:2012 *Trees in relation to in relation to design, demolition and construction. Recommendations*'. Works required within the root protection area (RPA) of trees, hedgerows to be retained will follow a project specific arboricultural methodology for such works, prepared / approved by a professional qualified arborist.
- Trees and vegetation identified for removal will be removed in accordance with 'BS 3998:2010 *Tree Work – Recommendations*' and best arboricultural practices as detailed and monitored by a professional qualified arborist.
- The construction site will be fully enclosed and secured. Construction traffic accessing the site will follow agreed routes and public roads will be maintained in a clean and safe manner.

Mitigation of landscape and visual impacts during the construction phase is focused on ensuring protection of elements to be retained and providing for a degree of visual screening of particular aspects of the works (e.g. the construction compounds).

14.5.2 Operational Phase

The Operational Stage of the Proposed Development will not give rise to significant landscape and visual effects and therefore measures for the mitigation of significant landscape and visual impacts are not required. Nevertheless, the Proposed Development includes a number of measures, including those in the proposed landscape masterplan (BSM, 2023) – refer to **Figure 14.4**, which will ensure its integration within the local setting. The Proposed Development includes for:

- Provision of a high-quality of architectural design, character and finish for the proposed buildings and development.
- Provision of significant areas of new and connected open space and pocket parks with play facilities and kick-about areas as amenity and recreation for the new communities. The proposed layout and open spaces provide for retention and incorporation of the mature beech trees along Church Road and for interface with the permitted footpath and cycleway network to the east and Eastern Linear Park to the south.
- Planting of new trees along streetscapes and within open spaces. Species selected will be appropriate to the street environment and to the characteristics of this coastal edge location.
- Provision of communal semi-private open space for each of the apartment blocks.
- Provision of a high-quality of design and finish for landscape areas within the Proposed Scheme.
- Landscape areas will be maintained for twelve months during which any defective or dead material will be replaced.
- Open spaces will be managed by Fingal County Council.

Figure 14.4 Proposed Landscape Masterplan, (BSM, 2023)).

14.6 Residual Impacts

On completion of the construction stage a new development will establish its presence on the environmental, physical and visual character of its environs.

It is considered that the proposed development is appropriately sited, designed and laid out so as to be capable of being fully integrated into the existing and emerging residential character of the wider area. This integration is underpinned by the architectural approach and by the landscape masterplan and landscape strategy, which acknowledges and builds on those established in the previously permitted Church Fields Housing and Eastern Linear park development.

Therefore, the Proposed Development will have an overall positive impact on the local character, and will not adversely impact any sensitive landscape characteristics. It is considered that the operational stage of the development will make a continued positive contribution to the residential community of the wider area.

The sensitivity of the receiving landscape and visual environment is assessed as being Low to Medium and the Magnitude of Change is considered Medium. The landscape impact of the Operation Stage is assessed as being of Moderate, Positive and Medium to Long-term significance.

14.6.1 Photomontages

Photomontages of the proposed development have been prepared and included in the Photomontage Booklet, which accompanies the application. Each view is presented in an 'As Existing', As Permitted' and 'As Proposed' version. The location of the Photomontage Views are shown on **Figure 14.5**. The views, which have been selected on the basis that they are representative of views of the site within the existing landscape, show the overall limited visibility of the proposed development and where visible, the positive visual effect of the proposed development.

Figure 14.5 Location of Photomontages and Site (extract from Photomontages booklet, (BSM, 2023)).

View 1: Wellview Avenue south of the Site

The 'As Existing View' is across the existing open space with the hedgerow to the south of site and mature trees along Church Road in the background.

The 'As Permitted View' shows the rooftops of the development over the existing hedgerow (in the permitted Eastern Linear Park) on the left-hand side of the image.

The 'As Proposed View' shows the upper aspects of housing and apartment blocks within the proposed development over the existing hedgerow (in the permitted Eastern Linear Park) on the middle and right-hand side of the image.

View 2: Damastown Avenue north-west of the Site

The 'As Existing View' is along and across Damastown Avenue with the existing roadside berm and mature trees in the background.

The 'As Permitted View' shows new development behind a new boundary hedgerow and tree-line, with the permitted footpath and cycleway infrastructure (currently under construction) along Damastown Avenue.

The 'As Proposed View' shows the continuation of proposed development with a consistent roadside boundary treatment.

View 3: R121 north-east of the Site

The 'As Existing View' is south-west across the existing roundabout to the Site. The 100kV transmission line which crosses the north-east corner of the Site is visible in the view.

The 'As Permitted View' shows the rooftops of the development in the lower background of the image.

The 'As Proposed View' shows the prominent of apartment blocks D and E in defining the junction of Church Road and Damastown Avenue at the roundabout.

View 4: Mulhuddart Cemetery east of the Site

The 'As Existing View' is across the cemetery grounds to the cemetery entrance and mature trees and vegetation along Church Road.

The 'As Permitted View' shows some glimpsed but limited visibility of development through the tree-line.

The 'As Proposed View' shows an increased visibility of the proposed development as it moves closer to Church Road and existing trees on the site are removed.

View 5: Mulhuddart Church (in ruins) and Graveyard south-east of the Site

The 'As Existing View' is across the graveyard to the mature trees and vegetation along Church Road.

The 'As Permitted View' shows some glimpsed but very limited visibility of development through the tree-line.

The 'As Proposed View' shows similar glimpsed but very limited visibility of the proposed development through the tree-line. The proposed development is outlined in red for context purposes.

View 6: Lady's Well, Church Road south of the Site

The existing view of Lady's Well, a protected structure, from Church Road. There is no view of the previously permitted or proposed development at Church Fields and as such the proposed development is only shown outlined in red for context purposes.

14.6.2 Worst Case Impact

In a scenario where landscape and visual mitigation measures were not implemented or failed, the worst-case landscape and visual impact of the Construction Stage is assessed as being of Moderate, Negative, Short-term significance.

In a scenario where mitigation measures were not implemented or failed the worst-case landscape and visual impact of the Operational Stage is assessed as being of Moderate, Negative, Short to Medium-term significance.

14.7 Monitoring

14.7.1 Construction Stage

Landscape and visual mitigation measures will be monitored during the construction stage. This will include siting of the construction compound; protection of the permitted Eastern Linear Park grounds, protection of trees / hedgerows to be retained; stripping and storage of topsoil; reinstatement of landscape / soil areas; and completion of landscape works.

14.7.2 Operational Stage

No monitoring other than normal management of landscape areas is required during the operational stage.

14.8 Reinstatement

14.8.1 Construction Stage

All landscape areas disturbed by the construction works will be reinstated prior to the completion of construction works. Any materials or plants which fail within the twelve month aftercare period will be replaced.

14.8.2 Operational Stage

Any landscape materials, plants or areas which fail during the on-going operational stage will be replaced.

14.9 Interactions

14.9.1 Biodiversity

The removal of existing vegetation will have a slight, negative interaction with landscape and visual aspects. The landscape masterplan (**Figure 14.4**) provides for significant additional planting and provision of wildflower grasslands which will enhance local biodiversity.

14.9.2 Land, Soils, Geology and Hydrogeology

The removal of existing topsoil will have a slight, negative interaction with landscape and visual aspects. The landscape scheme provides for reuse of a portion of retained topsoil within gardens and open space areas.

14.10 Cumulative Impacts

14.10.1 Construction Stage

Construction works in the immediate surrounds are either on-going and will be complete prior to the construction of the proposed development, or alternatively of small scale with low effects on the landscape and visual environment.

Construction of the permitted Church Fields Housing and Eastern Linear Park is scheduled to commence later in 2023 and will be complete or will be substantially complete prior to commencement of works on the proposed development.

There is potential for further residential development on the Church Fields West lands, however, this area still requires design development and consent prior to such works. As such, any major construction

on the Church Fields West lands are not expected to overlap with the construction of the proposed development.

Other construction works in the wider area are not expected to give rise to any cumulative landscape or visual impact with the construction of the proposed development.

Given the low sensitivity of the environment and the medium magnitude of change associated with the construction stage the cumulative landscape and visual impact is assessed as being of Moderate, Negative Short-term significance.

14.10.2 Operational Stage

During the operation stage the proposed development will complete the planned residential development within the Church Fields East area of the Church Fields lands. The proposed development is in keeping with the character and nature of previously permitted development at Church Fields and is supported by permitted Class 1 Open Space in the form of the Eastern Linear Park.

The cumulative landscape and visual impact of the Operation Stage is assessed as being of Moderate Positive Medium to Long-term Significance.

14.11 Difficulties Encountered

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

14.12 References

- *European Landscape Convention 2000.*
- Environmental Protection Agency (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports.*
- Fingal County Council (2023) *Fingal Development Plan 2023 – 2029*.
- Landscape Institute and the Institute of Environmental Management and Assessment (2013) *Guidelines for Landscape and Visual Impact Assessment 3rd edition*
- Landscape Institute (2018) *Technical Information Note 05/2017 (Revised 2018) on Landscape Character Assessment*.
- *Planning and Development Acts 2000 - 2023*
- *Planning and Development Regulations 2001-2023*

15 Cultural Heritage, Archaeology & Architectural Heritage

15.1 Introduction

This report forms part of an Environmental Impact Assessment (EIAR) for a proposed residential development at Church Fields East, Mulhuddart, Dublin 15. The site forms part of a wider site strategy plan for the area and includes the previously permitted Church Fields Housing and Eastern Linear Park Development (FCC ref Part XI/011/19) to the west. This EIAR will accompany the planning application for the proposed development site (Church Fields East) and it assesses the cumulative impact of the proposed and planned developments.

The objective of the report is to assess the impact of the proposed development on the receiving cultural, architectural, and archaeological heritage environments and to propose ameliorative measures to safeguard any monuments, features, finds of antiquity or features of architectural or cultural heritage merit.

This assessment has been prepared in accordance with the EIA Directive 2014/52/EC and current Environmental Protection Agency (EPA) guidelines. This section should be read in conjunction with the site layout plans and project description sections of this EIAR.

Chapter 15 of this Environmental Impact Assessment has been prepared by Courtney Deery Heritage Consultancy Ltd (CDHC) for Brady Shipman Martin (BSM), on behalf of the client, Fingal County Council and provides the cultural heritage (comprising archaeological, architectural, and cultural heritage) background relating to the proposed development.

15.1.1 Study Area

The proposed development relates to a site of c.5.52 hectares at Church Fields East, Mulhuddart, Dublin 15. The development site is located south of Damastown Avenue; west of Church Road; east of previously permitted residential development at Church Fields (Planning Reg. Ref.: PARTXI/012/21); and north of a permitted linear park (Eastern Linear Park Planning Reg. Ref.: PARTXI/012/21), in the townland of Tyrrelstown, Dublin 15. The proposed site is located in Tyrrelstown townland, in the civil parish of Mulhuddart and the barony of Castleknock. The site incorporates a former playing field west of Church Road and areas of previously disturbed ground to the north and south-west.

The site is located north-west of protected structure Mulhuddart Church (in ruins) and Graveyard (RPS No. 670, both of which are also recorded monuments (RMP DU013-010001, -010003), located on the opposite (east) side of Church Road.

15.1.2 Proposed development

The proposed development seeks the construction of 217 no. residential units (ranging from 2 – 4 storeys in height) in a mixed tenure development, comprising of 121 no. houses and 96 no. apartments. The development will also include the provision of car parking, cycle parking, new pedestrian / cycle links, services, drainage and attenuation, and all associated site and infrastructural works.

A detailed description of the proposed development is provided in Chapter 5 of this EIAR.

15.2 Method

15.2.1 Desk Based Assessment

The desk study was based on the examination of published and unpublished documentary and cartographic sources and draws on material previously compiled as part of assessments carried out during earlier phases of this project (Ryle 2020; Courtney 2021; McGlade 2021). Consultation has taken place with the design team. The following sources were availed of:

- The National Monuments, Preservation Orders and Register of Historic Monuments lists were sourced directly from the Department of Housing, Local Government and Heritage (DHLGH);
- Record of Monuments and Places (RMP) and Sites and Monuments Record (SMR). The SMR, as revised in the light of fieldwork, formed the basis for the establishment of the statutory Record of Monuments and Places in 1994 (RMP; pursuant to Section 12 of the National Monuments (Amendment) Act, 1994); The RMP records known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites identified as cropmarks on vertical aerial photographs. The information held in the RMP files is read in conjunction with published constraint maps. Archaeological sites identified since 1994 have been added to the non-statutory SMR database of the Archaeological Survey of Ireland (National Monuments Service, DHLGH), which is available online at www.archaeology.ie and includes both RMP and SMR sites. Those sites designated as SMR sites have not yet been added to the statutory record, but are scheduled for inclusion in the next revision of the RMP;
- Record of Protected Structures (RPS) and Architectural Conservation Areas (ACAs), Fingal County Development Plan (2023-2029);
- The National Inventory of Architectural Heritage (NIAH) Building Survey and Garden Survey (DHLGH) highlight a representative sample of architectural heritage in the county and raise awareness of the wealth of same. The NIAH surveys can be reviewed online at www.buildingsofireland.ie;
- The topographical files of the National Museum of Ireland;
- National Folklore Collection (Duchas.ie) ;
- Cartographical sources included, Down Survey (1656), Rocque's map of Dublin (1760), Taylor's map of Dublin (1816), and various editions of the OS Maps;
- Excavations Bulletins and Excavations Database (1970-2022);
- Aerial imagery (Google Earth 2001–2021, Bing 2023; Osi 1995, 2000, 2005, 2011-13, 2013-18);
- Other documentary sources (as listed in the references at the end of this chapter).

15.2.2 Field Inspection

The proposed development site was inspected in September 2021 by Lisa Courtney of CDHC as part of a cultural heritage appraisal for development lands to the immediate west of the site and incorporating part of the current application site along its southern side. During this inspection, all of the current application site was inspected and the designated asset (Mulhuddart Church and Graveyard) to the east was visited. This fieldwork did not identify any previously unrecorded, visible features of cultural heritage interest.

15.2.3 Legislation, Standards and Guidelines

The following legislation and guidelines were considered and consulted for the purposes of the report:

- National Monuments Acts, 1930-2004;

- The Planning and Development Act 2000, as amended;
- Heritage Act, 2018;
- Environmental Protection Agency (EPA) (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports. May 2022;
- European Commission (2017). Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 and the Planning and Development Act 2000;
- Code of Practice between the National Roads Authority (NRA) and the Minister for Arts, Heritage and the Gaeltacht, June 2000;
- Code of Practice for Archaeology agreed between the Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs and Transport Infrastructure Ireland, 2017;
- Guidelines for the Assessment of Architectural Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes, 2005, NRA;
- Council of Europe (1985). Convention for the Protection of the Architectural Heritage of Europe (ratified by Ireland 1997), 'Granada Convention';
- European Convention on the Protection of the Archaeological Heritage 1992 (the Valletta Convention) was ratified by Ireland in 1997. Such agreements place legal obligations on the State in relation to the recording, conservation and management of archaeological and built heritage.
- Council of Europe (2005). Framework Convention on the Value of Cultural Heritage for Society, 'Faro Convention';
- ICOMOS (2011). Guidance on Heritage Impact Assessments for Cultural World Heritage Properties;
- ICOMOS Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 2005.

15.2.4 Cultural Heritage

Cultural heritage is a broad, and in a way an open term, which was once exclusively used to refer to monumental remains and objects. However, in addition to the physical cultural heritage features that are recognised and protected by legislation, cultural heritage is a term that now has come to include a wide range of tangible and intangible cultural considerations that are linked to and bound up in cultural memory and associations, belief traditions, past knowledge, traditional and arcane practices, craft and building skills, and oral tradition of local populations.

15.2.5 Assessment Criteria

Cultural heritage sites are considered to be a non-renewable resource and cultural heritage material assets are generally considered to be location sensitive. In this context, any change to their environment, such as construction activity and ground disturbance works, could adversely affect these sites. The likely significance of all effects is determined in consideration of the magnitude of the impact and the baseline rating upon which the impact has an effect (i.e., the sensitivity or value of the cultural heritage asset). Having assessed the potential magnitude of impact with respect to the sensitivity /

value of the asset, the overall significance of the effect is then classified as not significant, imperceptible, slight, moderate, significant, very significant, or profound.

A glossary of impact assessment terms, including the criteria for the assessment of effect significance, is contained in Appendix 15.2.

15.3 Baseline Environment

15.3.1 Archaeological and Historical Background Development

15.3.1.1 Prehistoric Activity (c. 4000BC – c. 500 AD)

At present, there is no evidence for prehistoric activity within or in the environs of the proposed development site. The earliest evidence for human activity in the wider area is recorded in the Tolka River valley, c. 1.6km south-west of the proposed development site. A group of *fulachtaí fia* (SMR Ref: ME051-036, ME051-038, and ME051-039) and burnt mounds (SMR ME051-010 and ME051-035) are located c. 3km to the west in County Meath. *Fulachtaí fia*, or burnt mounds, are one of the most common discoveries of development-led investigations. They typically date to the Bronze Age and are usually found in wet areas adjacent to watercourses. They comprise of pits or troughs which were typically lined with timber, wattling or stone, and which were filled with water. Stones would be heated in an adjacent fire and immersed in the water to heat it. Spent or shattered stones were subsequently discarded around the trough in a characteristic horseshoe shape. These features are typically interpreted as cooking places, possibly open-air feasting areas for small family groups (Hawkes 2015). Other interpretations also include their use for bathing, dying, or brewing.

15.3.1.2 Early Medieval Activity (c. 500 AD – c. 1100 AD)

In the early historical period, the study area formed part of the over-kingdom of Brega, with kingship of an area lying within the modern baronies of Coolock and Castleknock (and extending into adjacent parts of Meath) belonging to the ruling line of Gailenga Becca, one of the subject peoples of Brega. According to the topographical poems, the eastern reaches of its territory extended as far as Glasnevin (Carney 1943, 78; Smyth 1982, 18, 46, 152). It appears likely that the Gailenga Becca provided the local aristocracy in the area that later formed the barony of Castleknock, and members of the lineage may well have been associated with the small number of ringfort sites located in the wider area.

The classic early medieval settlement type, ringforts were often located in the vicinity of Early Christian ecclesiastical sites. They are the commonest monument type in Ireland and consist of circular areas, defined by banks and external ditches. There are relatively few ringforts in Dublin and very few located in north County Dublin, possibly due to the intensive agricultural regime in this part of the county and the highest concentration of Anglo-Norman settlement in the country, with consequent tillage, which could had resulted in sites being ploughed out and no longer recognisable above ground. Often, the only indication of the former presence of such monuments is found in placenames with elements such as dún, rath or cashel: the occurrence of 'rath' in two neighbouring placenames (Cruiserath and Hollywoodrath) could reflect an early medieval occupation of the surrounding area.

There are two ringforts (RMP DU013-015 and DU013-016) known in the wider landscape, however, located c. 1.5 and c. 1.8km respectively from the proposed development site in Corduff townland. Two enclosure sites (RMP DU013-005 and DU013-030) are also recorded in the townland of Parslickstown,

c. 1km and c. 1.4km to the southwest, and may represent ploughed-out ringforts. They were identified by aerial photography and are not visible at ground level.

15.3.1.3 Medieval Activity (c. 1100 AD – c. 1600 AD)

Following the Anglo-Norman invasion of 1169, this area formed part of two manors, Belgree and Castleknock. The lands surrounding the proposed development site, namely the townlands of Cruiserath, Buzzardstown, Huntstown, and Tyrrelstown, belonged to the manor of Castleknock. Many of the names of these townlands derived from their original occupants in medieval times, like William Bossard for Buzzardstown, the Hunt family for Huntstown, and Tyrrell for Tyrrelstown.

The church and graveyard (RMP DU013-010001, -010003; RPS 670) in Buzzardstown (opposite the proposed development site on Church Road), known as Mulhuddart Church, dates to the 14th century. Though the original dedication of the church remains unknown, it is thought to have been founded as a second prebend of the Cathedral of St Patrick Castleknock in 1260. It is not until a century later that the name Mulhuddart is mentioned in connection with the church site.

Henry VI established 'the guild and fraternity of our Lady of St. Mary of the Church of Mulhuddart', which by 1472 owned considerable property (Ball 1912, 44-45, Vol VI). The church, dedicated to the Blessed Virgin Mary, was a member of one of the chapters of St Patrick's Cathedral and the terms of the guild included provision for a minimum of two chaplains, for whom the square tower may have been built (Ronan 1940). In 1532 Henry VIII granted a licence for the collegiate foundation of a religious guild of the Blessed Virgin Mary at Mulhuddart. The guild, which continued until 1572, made provision for a master and two wardens, with power to erect a chantry for two or more chaplains serving the parish (Gwynn and Hadcock 1988). With the dissolution of St Patrick's Cathedral in the 16th century, the prebend of Mulhuddart had assigned to it the tithes from the townlands of Belgree, Buzzardstown, Kilmartin, Paslickstown and Tyrrelstown (Carroll 2007).

The Church is noted as being in good repair in 1613, although in 1630 Archbishop Buckley states that both the chancel and nave were in ruins. In the early 1600s the area suffered badly from incursions from numerous armies. During the period of 1641 to 1649, the parish of Mulhuddart is recorded to have been laid to waste by contending armies, it was recorded that 'no building of importance escaped destruction'.

The church located in Mulhuddart graveyard is in a prominent position with land falling away gently to the west and steeply to the south. It consists of an undivided nave and chancel with a residential west tower that survives to first floor level. The townland boundary curves to the west of the church and it appears to be following a possible circular enclosure bounding the church and the associated graveyard.

A vaulted well house known as Lady's Well (RMP DU013-009, RPS 671) is located c. 230m south of the graveyard which surrounds the church. It stands on the western side of Church Road and is approached by stone steps. On the roof of the superstructure are two finials, one of which is stone carved with a cross in relief and the other is represented as a stone niche with an inscription. The well was associated with the feast of the Nativity of the Virgin, and was frequented on 8th September, known as Lady's Day. Water from the well is reputed to cure sprains, cuts, bruises, and rheumatism (Ball 1920).

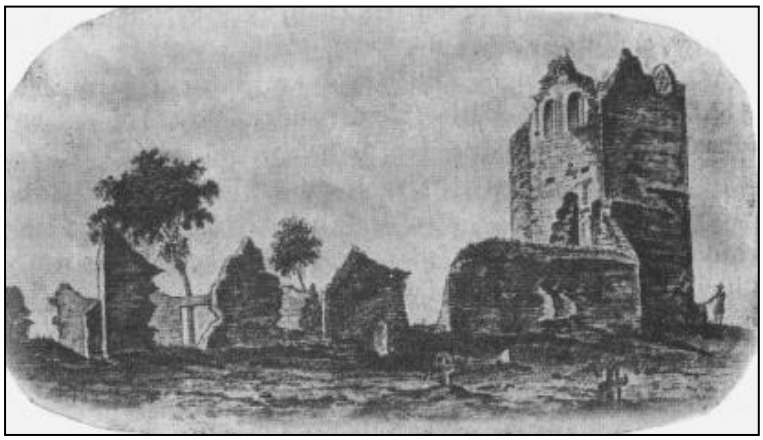
The pattern at Lady's Well was a source of scandal and outrage during the 18th century, as the yearly pattern at this site was reported to draw large crowds who frequently engaged in drunkenness and brawling at the site (Butler 1892). In 1754 it was recorded that the clergy were attempting to put a stop

to the 'scandalous excesses that are annually committed at the Well' having prevailed upon the landholders contiguous not 'to permit any tents or booths to be erected' (Lacey 1999).

The well remained a popular site for pilgrimage until the 19th century until practice of holy well visitation began to decline throughout the country. Local folklore associated with the site, tells of an instance where the well was filled up by local men but immediately after they had finished, the well sprung up on the opposite side of the road. The grove around the site is no longer present and well is still visited and venerated today, with people leaving offerings of flowers and money.

A sketch of the church by Gabriel Beranger (1775) depicts the church site as ruinous (**Figure 15.1**). Austin Cooper in his 1781 account of the church describes a tower, vaulted on the ground-floor and the remains of a staircase in the southwest corner.

Figure 15.1 Mulhuddart Church in 1777 after Ball 1920



15.3.1.4 Post-Medieval Activity (c. 1600 AD – 1800 AD)

The commonwealth surveys (Down Survey, Civil Survey and Hearth Money Rolls in Public Records Office) show that no buildings of importance in Mulhuddart escaped the destruction of the rebellion years (1641-1649). In April 1643, a party of horses was sent out to the area from Dublin by Ormond while in the following year the Earl of Cavan was encamped in Mulhuddart with a large number of troops for several days. He was in great need of equipment and provisions and addressed more than one urgent appeal to Ormonde from quarters in Mulhuddart church. In 1647 Owen Roe O'Neill passed through the parish and in the following year Mulhuddart was garrisoned with 72 men and seven non-commissioned officers under the command of Sir Francis Willoughby, with John Bradshaw as lieutenant and Thomas Barnes as ensign (Carroll 2007).

The houses of Buzzardstown, Paslickstown and Cruiserath are noted as small, thatched structures during the 17th century (Ball 1920). Amongst the residents in the 18th century the owners of Buzzardstown are prominent. In the first half of the century the family Royne, and in the second half the family of Flood, were in possession. On the winter's night in 1761 it is recorded that 'the gable-end of Mr. Flood's house at Mulhuddart suddenly gave way, whereby Mrs. Flood and her daughter were killed' (Carroll 2007). A post-medieval building is recorded at Buzzardstown (RMP DU013-023). Buzzardstown House consists of a late 19th century, two-storey, four-bay house with additional later wing (Trehy 2008).

Tyrrelstown was occupied by cadets of the Tyrell family. The chief seat of the Tyrell was at Powerstown. By the 16th century, the Tyrells were succeeded as chief residents by the Bellings. Richard Bellings was

the Solicitor-General for Ireland between 1574 and 1584. He was granted Tyrrelstown, Buzzards, Parslicktown and Macetown, together with a mill and watercourse and it was around this time that a large house was built on the lands of Tyrrelstown (Ball, 1920).

Tyrrelstown House (RMP DU013-006; RPS 673) is the site of a mid-17th century house built by the Bellings family, who acquired Tyrrelstown around 1580 (Ronan 1940). The house is noted on the Down Survey (1655-6) map and described in the Civil survey (1654-6) as 'the walls of a great stonehouse'. It was damaged in the 1641 Rebellion, which devastated the area and only the walls of the house remained. The earliest portion of the modern house structure dates to 1720 and a detached five-bay two-storey house was added to this structure c.1820. The gardens of Tyrrelstown House have been significantly reduced over time, with the land having been subdivided to create a golf course and housing developments. The gardens comprise 10 hectares of parkland and include two walled gardens, which are over 600 years old.

15.3.2 Historic Cartographic Sources

15.3.2.1 The Down Survey maps (1656 - 1658)

The Down Survey was undertaken by William Petty in the 1650s and was at the time the most detailed mapping project to ever have been undertaken, the intention being to accurately survey the land in order to redistribute it among merchant adventurers and English soldiers.

Tyrrelstown is located within the Barony of Castleknock in Mullhuddart civil parish ('*Parrish of Mallahidert*'). The barony map shows the townland of Tyrrelstown very similar in shape as it is today (**Figure 15.2**). A church and one other structure are indicated in Buzzardstwon ('*Burrardstonne*'), two houses are depicted in Parslickstown ('*Pasloestonne*'), and a large house and five smaller structures are shown within Tyrrelstown ('*Terrellestonne*'). A 'farmhouse' ascribed to 'Sir Henry Bealing, Irish papist' is recorded on the parish map (**Figure 15.3**), whilst the parish terrier mentions '*In Terrelstowne there stands the walls of a large house, in Buzardtowne one farmhouse, in Pasloestowne one farmhouse*'.

Figure 15.2 Down Survey map of the Barony of Castleknock

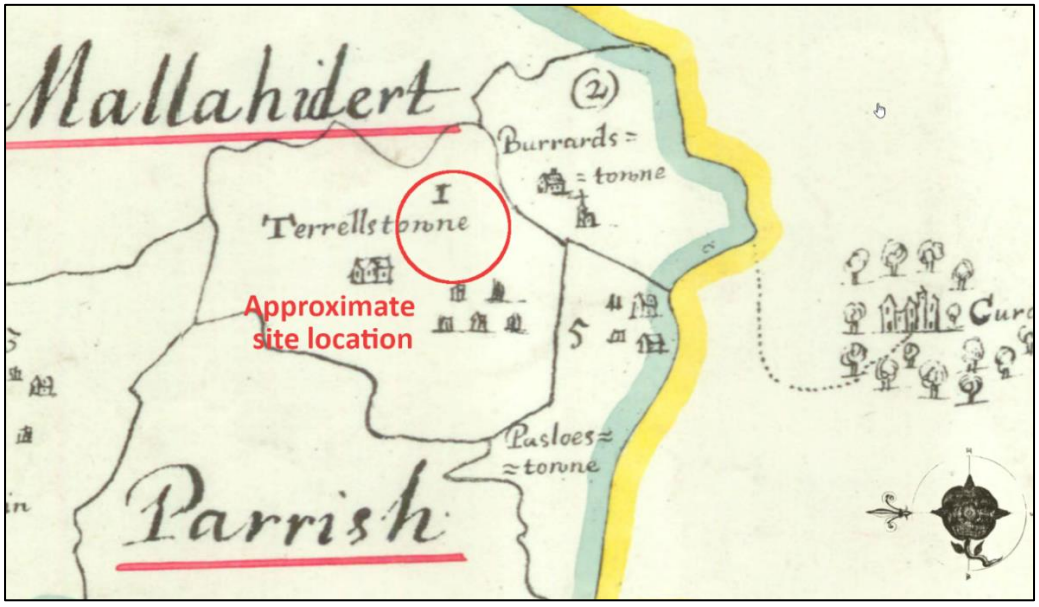
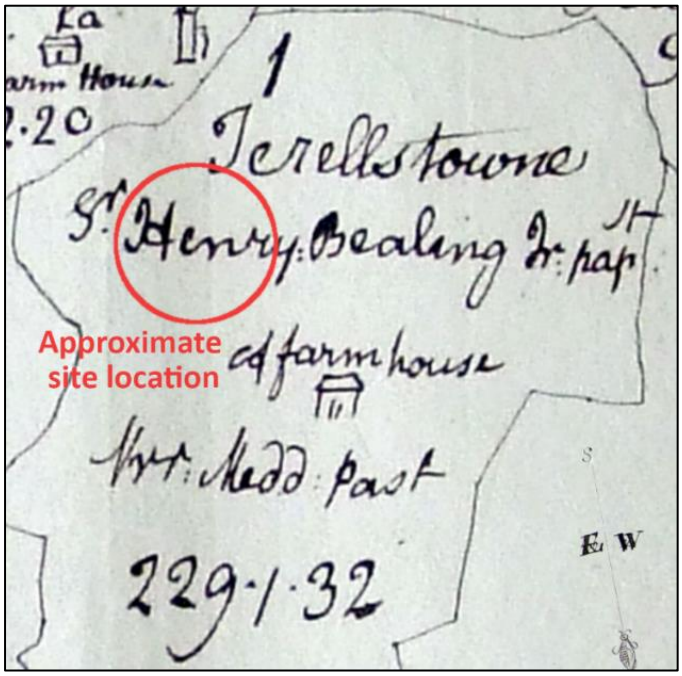


Figure 15.3 Down Survey map of the parish of Mullhuddart



15.3.2.2 Rocque's 'An actual Survey of the County of Dublin' (1760)

Rocque's map of 1760 shows a well laid out area, consisting or roadways, neat fields, and a bridge over the river to the south with a mill in place. Church Road and Powerstown Road are depicted following the same course as the present day. Tyrrelstown House is named as '*Terrels Town*' and is shown on the map along with the church ('*Mallahidert Church*') and well ('*Ladys Well*'). The church is shown surrounded by a graveyard and appears to be enclosed by a boundary forming a circular area around the church. The proposed development site is shown as a green field to the south of Tyrrelstown House and west of the church and graveyard. There is a laneway shown that connects these two features and this would have crossed the proposed development area in a northwest-southeast direction. A series of hedge-lined small fields are depicted to the south (**Figure 15.4**).

Figure 15.4 Rocque's Map of the County of Dublin, 1760

15.3.2.3 Taylor's Map of the Environs of Dublin (1816)

Taylor's map of the Environs of Dublin (1816), drawn to illustrate the status of the Irish roads and the illustrious properties of the country, does not depict the exact locations of the field boundaries and land divisions within the proposed development site. However, it does provide more detail as to local topography and Tyrrelstown House estate (**Figure 15.5**). Tyrrelstown House was built c. 1720 (a later house was built c.1820 and attached to the earlier house) and is shown on this map as being surrounded by woodlands. There are two buildings and a farmyard within Tyrrelstown House and the two pathways from Tyrrelstown House are visible. The first pathway leads to Powerstown Road and the second leads to Mulhuddart Church, through the proposed development site.

Figure 15.5 Taylor's map of the Environs of Dublin (1816) with approximate site location in red

15.3.2.4 Ordnance Survey first edition six-inch map, 1835

The Ordnance Survey (OS) first edition six-inch map provides the earliest detailed and accurate depiction of the study area. This map shows the proposed development site located in one large agricultural field that was associated with the Tyrrelstown estate. Most of the surrounding field boundaries had changed and the fields had been lined with scrubs and trees, and clumps/copses of woodland had been planted. Church Road was also subject to extensive ornamental tree-planting as part of the demesne lands associated with Tyrrelstown House (**Figure 15.6**).

The realignment of the road around Tyrrelstown House and the expansion of the estate are the most obvious changes within the area at this time. Tyrrelstown House itself had also been substantially expanded and two gate lodges on either side of the estate are now depicted. The path connecting Mulhuddart Church and Tyrrelstown House is no longer apparent.

A gap in the tree-line opposite Mulhuddart Church is depicted on this map: that gap is still present today (**Figure 15.7**).

Figure 15.6 Ordnance Survey first edition six-inch map (1835) with approximate site location (in red)

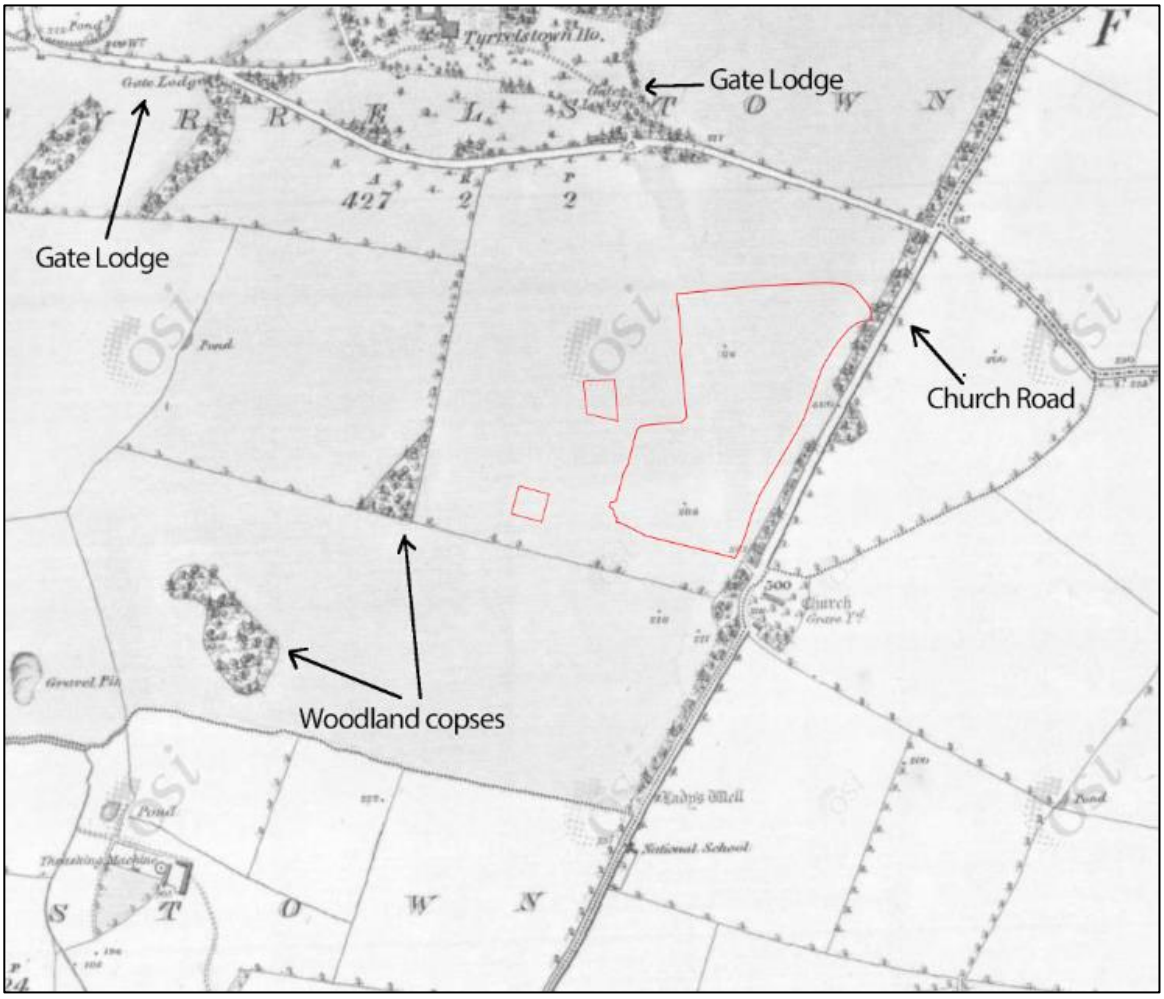
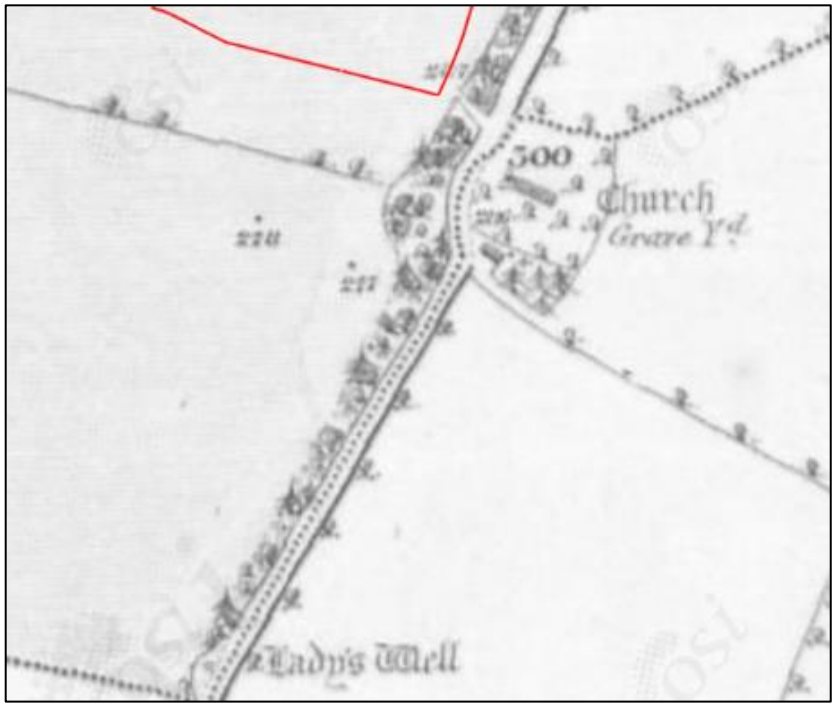


Figure 15.7 Detail of Mullhuddart Church and Lady's Well on the OS first edition six-inch map with approximate site boundary (in red)



15.3.2.5 Ordnance Survey 25-inch map, 1906

Further changes to the field boundaries in the wider area can be seen on the OS 25-inch map (**Figure 15.8**), including the removal of a boundary to the west of the proposed development site, creating one very large field. Many of the hedge lines in the wider area had been removed, creating a number of large fields with connected enclosures. Remnants of one woodland copse survived these changes, to the southwest of the proposed development site.

Aside from the removal of one of the roads within the grounds of Tyrrelstown House and the addition of a spring to the western edge of the estate past the lodge house, the grounds were largely unchanged (**Figure 15.8**). Mulhuddart Church is noted as being in ruins on this map and a new estate of Mountain View was established in the lands immediately adjacent to it. Lady's Well is shown and named on the map (**Figure 15.9**).

Apart from the reinstatement of the field boundary to the east of the woodland planted area, there are no other significant changes within the proposed development site and its surroundings on the revised six-inch edition (not shown), compiled six years later (1912).

Figure 15.8 Ordnance Survey 25-inch map (1909) with approximate site location (in red)

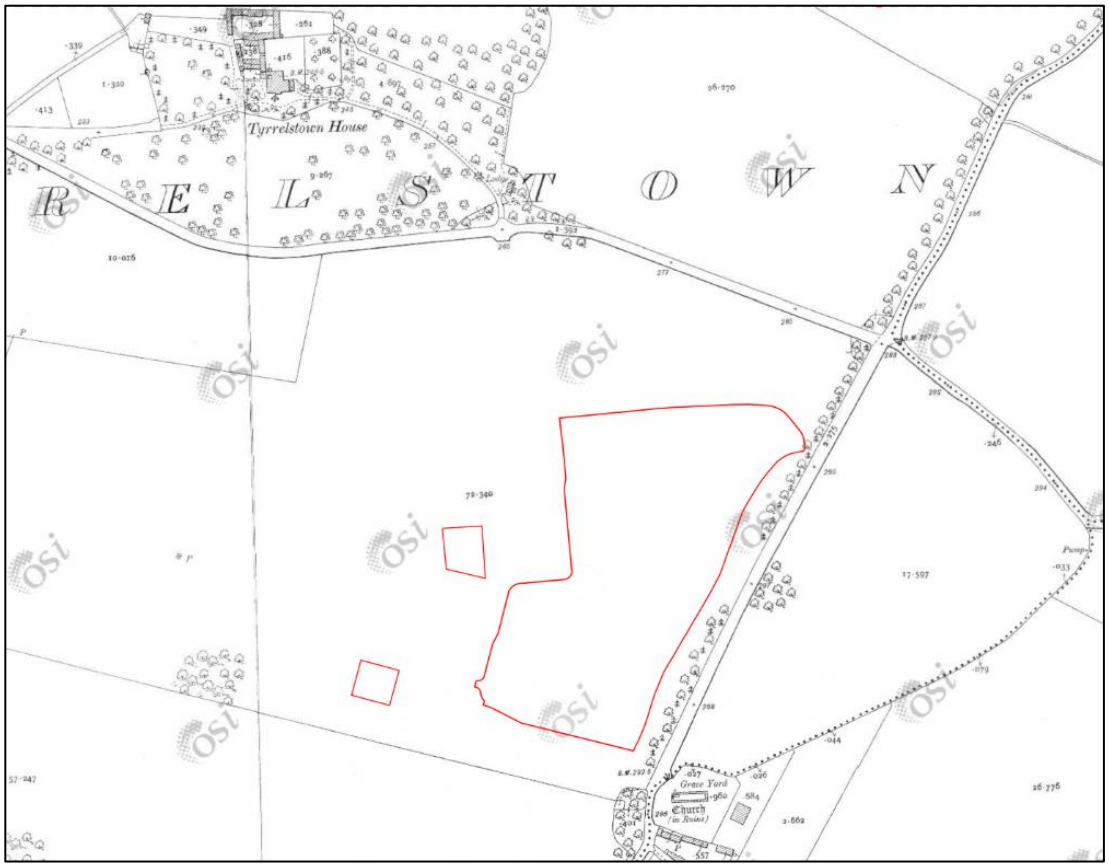
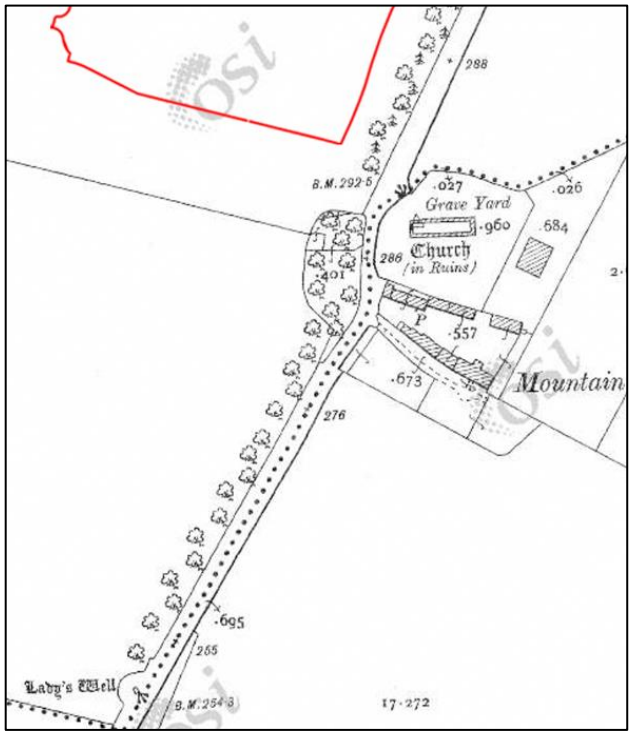


Figure 15.9 Detail of Ordnance Survey 25-inch map (1909) of Mulhuddart Church, Lady's well and Mountain View with approximate site location (in red)



15.3.3 Topographical files of the National Museum of Ireland (NMI)

There are no known stray finds from the Topographical files of the National Museum located within or in the vicinity of the proposed development site.

15.3.4 Previous Archaeological Investigations

Ground investigation (GI) works were carried out within the proposed development site between December 2022 and February 2023 (GII 2023), without archaeological supervision. This included the excavation of 5 trial pits / soakaways, 2 slit trenches, and 4 window sample boreholes. The sequence of strata encountered were consistent across the site and generally indicated made ground deposits beneath the topsoil to depths of between 1.5m and 1.8m BGL (made ground was deeper around the pipes where the base was not proven). The made-ground deposits were described as brown sandy slightly gravelly clay with occasional cobbles and contained rare fragments of concrete, metal, rope, wood and plastic. The cohesive deposits encountered between the made ground and the weathered bedrock comprised brown sandy gravelly clay with occasional cobbles and boulders. No organics were noted.

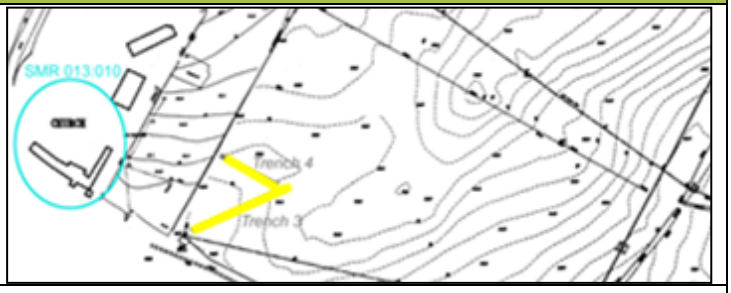
In the adjacent site to the west and in the southern part of the proposed development site, GI works (GII 2018) were undertaken in 2017 without archaeological supervision. These comprised the excavation of 50 trial pits and 5 soakaways, the results of which showed a similar sequence of strata. The soils were characterised as clay slit or sand with five areas of made ground described as brown/ black gravelly clay that contained fragments indicative of disturbance and later modern inclusions such as brick, wood, and plastic.

Another archaeological investigation, carried out in 2014 c. 605m east of the proposed development site, discovered the remains of an isolated pit, containing a small quantity of charcoal, seed, and burnt bone. The analysis of this content indicated that cereal-drying activity was ongoing in the vicinity, however no in situ burning was recorded. The pit, which appeared to contain domestic refuse, has been dated to the early medieval period (Licence No. 14E0141ext, Bulletin Ref. 2014:032).

There have been a further eight archaeological investigations conducted under licence in the surrounding area, including two to the east of Mulhuddart Church and graveyard. No features or deposits of an archaeological interest have been identified to date (**Figure 15.10, Table 15.1**).

Table 15.1 Previous archaeological investigations in the vicinity of the proposed development site

Licence No.	Bulletin Ref. No.	Name	Summary
N/A	N/A	Damastown Industrial Estate	Unlicensed monitoring was carried out prior to the construction of a logistics warehouse building and carpark at 6 Damastown Avenue, Damastown Industrial Estate, Dublin 15. No features or deposits of an archaeological nature were identified during the monitoring phase of works (Planning Ref. FW15AA/0059).
99E0046	1999:165	IDA, Blanchardstown Dublin (700m to E-SE)	Testing took place in close proximity and to the east of Mulhuddart church and graveyard as part of a previous application for the development of the IDA Blanchardstown Park. The trenches were excavated to a depth of c.0.60m and yielded no archaeological material (Planning Ref. F98A/0724).

Licence No.	Bulletin Ref. No.	Name	Summary
			
02E1754	N/A	Tyrrelstown, Dublin (520m to SW)	Monitoring was conducted in advance of an industrial development at the junction of Ladyswell Road and Tyrrelstown Road in Parlickstown Estate. No features or deposits of archaeological interest were identified (Planning Ref. F02A/1192).
07E0273	2007:435	Buzzardstown, Dublin (420m to SE)	The site was located within the constraint area of DU013–023, Buzzardstown House, in Mulhuddart, Dublin 15. Trial testing took place on the site in April 2007 prior to the construction of a new structure for community training to accommodate the Tolka River project, with associated stoned and blinded carpark. A total of six trenches were excavated. The testing of the site yielded no archaeological features or finds.
08E0878	2009:304	Damastown, Dublin	Monitoring was carried out at the site of an attenuation pond as part of the Leixlip–Ballycoolen water supply scheme at Damastown, Co. Dublin. All topsoil-stripping at the site was monitored but nothing of archaeological significance was revealed. (*wrong location on online maps*)
14E0141 ext	2014:032	Buzzardstown, Dublin (605m to E)	An excavation was carried out in the townland of Buzzardstown in the College Business & Technology Park, Blanchardstown, Dublin 15 in 2014. Two areas of archaeological potential were identified in earlier testing, in the SW corner of the development area. The three spreads recorded in Area 1 were identified as non-archaeological in origin. A single pit was recorded in Area 2 which contained a small quantity of charcoal, seed and burnt bone. It was not possible to determine if the bone was animal or human due to the condition and size of the fragments. Analysis of the seed and charcoal indicated cereal-drying activity was ongoing in the vicinity however no in situ burning was recorded. The pit, which appeared to contain domestic refuse, has been dated to the early medieval period.
15E0263	2015:491	Buzzardstown Dublin 15 (c. 385m to E)	The site is located on the R121, to the east of Mulhuddart graveyard on Church Road and adjacent to the Institute of Technology Blanchardstown and the Amazon Blanchardstown Corporate Park. 22 test trenches were excavated over two days in June 2015 and no features or finds of archaeological interest were identified in any of the trenches (Planning Ref. FW15A/0038).
15R0056		Buzzardstown Dublin 15 (c. 385m to E)	A geophysical survey (15R0056) was undertaken by J.M Leigh Surveys east of Mulhuddart Church and graveyard. The survey was conducted within the northern field of the proposed development as the remainder was inaccessible due to vegetation cover. It identified a high degree of modern disturbance along the western, northern and eastern boundaries. Within the field a number of isolated features and trends were identified as ferrous or being of low archaeological potential. The features identified in the geophysical survey were targeted by

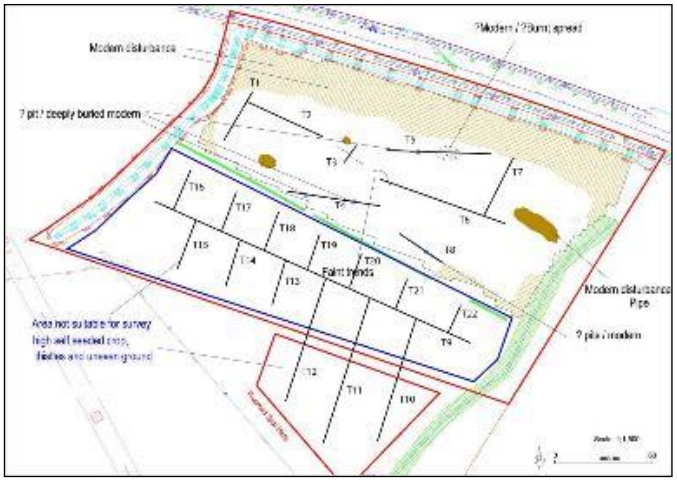
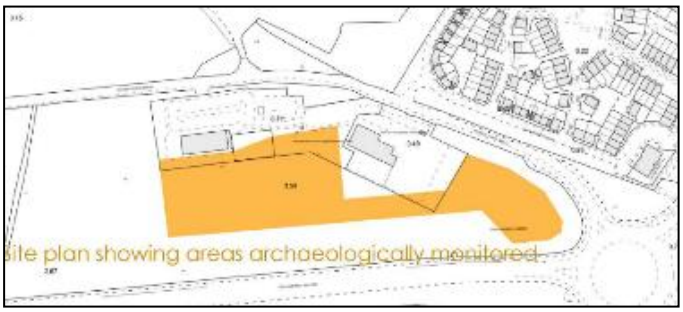
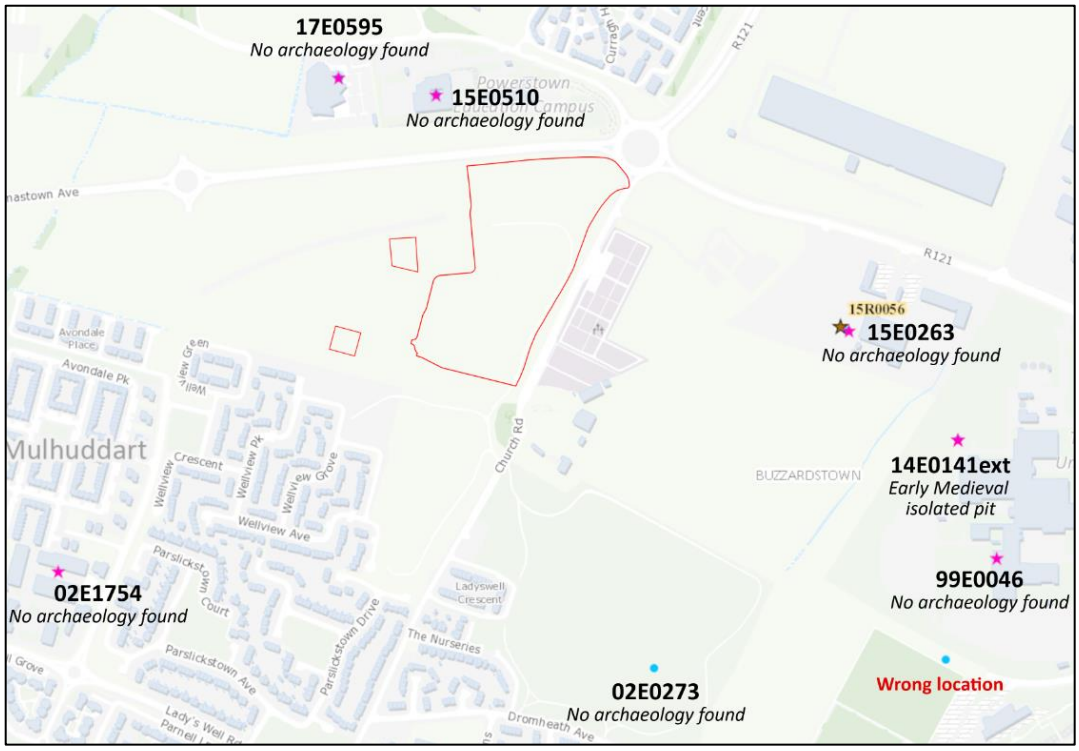
Licence No.	Bulletin Ref. No.	Name	Summary
			archaeological test trenches (15E0263) to establish their nature. None were of archaeological significance (Planning Ref. FW15A/0038). 
15E510	2016:123	Powerstown Educate Together School (90m to N)	Monitoring prior to the construction of new school buildings located between Powerstown Road and Damastown Avenue in Tyrrelstown townland, Dublin 15 was conducted from November 2015 to February 2016. A path connecting Tyrrelstown House and Mulhuddart Church was noted on Rocque's map of 1756 however no evidence of this or any other archaeological material was found during monitoring. 
17E0595	2017:412	Tyrrelstown, Dublin (125m to N)	Test trenching of a total of 263.49 linear metres was conducted at a proposed development site south of Tyrrelstown House and north of Damastown Avenue. No features of archaeological interest were identified (Planning Ref. FW16A/0181).

Figure 15.10 Previous archaeological investigations in the vicinity of the proposed development site



15.3.5 Aerial photography

Aerial imagery from 1995 (not shown) demonstrates that the site has experienced disturbance from the development of a road and services, oriented from the southwest to the northeast in the northern half of the proposed development site. To the southwest of the site a residential housing estate was being developed. By 2005, the road was disused and overgrown with vegetation (Map Genie 2005, not shown). A strip of overgrown vegetation and tall trees is still visible on the most recent aerial photography (Google Earth March 2022) along the disused road (still visible as well), on the northern side of the proposed development site (**Figure 15.11**). The area in general (outside the proposed development site) is markedly more industrialised than it had been in 1995, with the construction of a number of industrial buildings southwest and northeast of the proposed development site.

Cropmarks visible on the 2020 aerial imagery (**Figure 15.12**) are indicative of some disturbance within this area in the past.

A review of the aerial photography shows that the central / south part of the proposed development site was occupied by two football pitches from 2013 to 2017 (**Figure 15.13**). After 2017, this area is shown as greenfield.

The construction of Damastown Avenue along with a southward trending haul road, which connected the growing industrial and residential areas of Damastown to Tyrrelstown, was opened in 2008 and on imagery dating to this time period (not shown), there are areas of spoil extending to the west of the proposed development site. An additional housing development was then in the process of being constructed to the southwest of the proposed development site. Additional disturbance, likely from the construction of Damastown Avenue, is noted at the northern boundary of the proposed development site. A former woodland copse as depicted on the historic OS maps still survives to the southwest of the site where a linear park is proposed.

Figure 15.11 Aerial photography (Google Earth 2022) showing proposed development site (in red) and surrounding area

Figure 15.12 Aerial photography (Google Earth 2020) showing cropmarks indicative of previous disturbance in the northern half of the playing field

Figure 15.13 Aerial photography (OSi 2013-18) showing proposed development site (in red)

15.3.6 Cultural Heritage

15.3.6.1 Townland placenames

Townland names are a rich source of information, not only on the topography, land ownership and land use within the landscape, but also on its history, archaeological monuments, and folklore. Where a monument has been forgotten or destroyed, a place name may still refer to it and may indicate the possibility that the remains of certain sites survive below the ground surface.

There are numerous place names with English forms in the area, reflecting its position within the Pale and the proximity to the English centre of power in Dublin City. One such example is Tyrrelstown, which comes from the Tyrell family name, especially Hugh Tyrell, who received the barony of Castleknock in 1173 from Hugh de Lacy during the Norman invasion of Ireland. This land grant included Tyrrelstown and portions of Clonsilla and Mulhuddart. The neighbouring townland of Buzzardstown similarly derives its name after the family of William Bossard, a 14th century occupant of the townland.

Some Irish toponomy suggests alternative land use that corresponds with the topography. The origins of the name Mulhuddart are unknown. Local folklore indicated that the Gaelic name could be *Mullac* Eadairne, which is commonly believed to represent the Irish *Mullach Eadartha* meaning 'the hill of the milking place'. The practice of booleying, the seasonal movement of cow between fixed summer and winter pastures for feeding or milking, has ancient origins and could predate the Norman arrival to the area. The name Mulhuddart could also derive from *Mullach-Chuidbert* (the mound of Cuthbert). St

Cuthbert is identified with the church of Kilmahuddrick to the northwest of Clondalkin. In the annals of St Mary's Abbey mention is made in A.D. 684 of Father Cuthbert 'a native of Ireland born in the village of Kilmocodrick' (Trehy 2008).

15.3.6.2 Townland boundaries

Townland boundaries may date to the early medieval period and are composed of varying natural or man-made topographical features such as watercourses, ditches, banks, or tree lines. Tyrrelstown is a fairly large townland, the boundaries of which have not changed much over time. The proposed development site is located close to the eastern side of the townland, where the boundary forms a bend curving eastward and forms the townland boundary between Tyrrelstown and Buzzardstown. It coincides with the townland boundary at its south-eastern corner, at Church Road.

15.3.6.3 The School Collection (Duchas.ie)

In the 1930s, children from Mulhuddart School recorded features and events of cultural heritage interest in the area, as part of The Schools' Collection that forms the National Folklore Collection. An earthen mound is referred to in Tyrrelstown townland and is described as being 85 feet in diameter (21m). Many suggestions are put forward for its use including that it was a mound built by Cromwell or that it was a burial mound (www.duchas.ie). This feature was reputedly located in the well field, which was the field beside the Lady Well, located to the south of the proposed development. This area is now built upon.

15.3.7 Archaeological Heritage

There are no recorded archaeological monuments (RMP / SMR sites) within the proposed development site. A church and graveyard are located to the south-east of the proposed development site, on the opposite (east) side of Church Road (RMP DU013-01001, DU013-01002), c. 22m and c. 14m away respectively (**Figure 15.14**, **Table 15.2**). The church, which is in ruin, is known as Mulhuddart Church and along with the graveyard is also in the Record of Protected Structures (see **Section 15.3.5**).

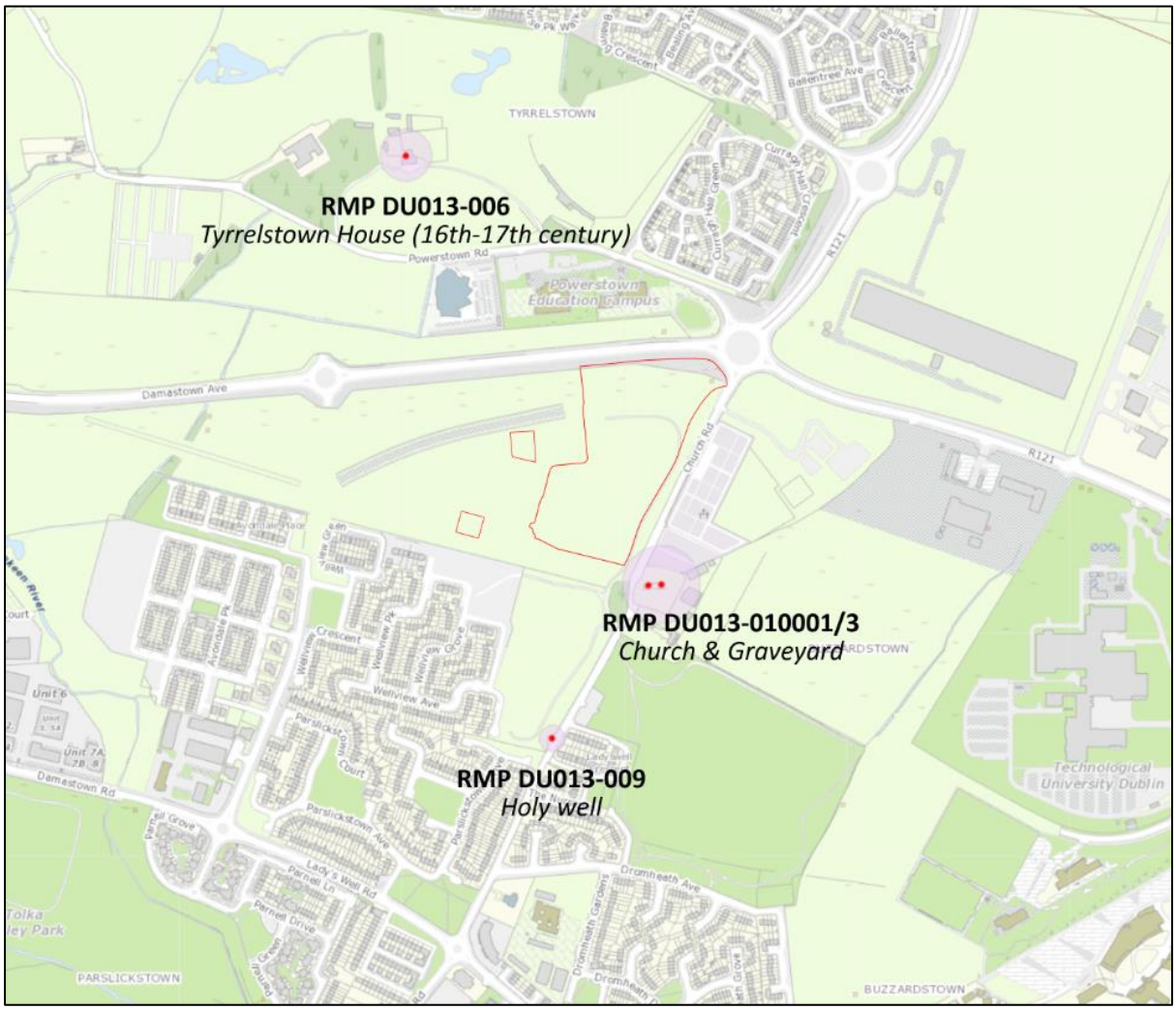
There are only two other RMP sites within 500m of the proposed development site: a holy well (RMP DU013-009) and a house site (Tyrrelstown House, RMP DU013-006). The sites are described in **Table 15.2**. Relevant sites in the wider area are discussed in the context of the proposed development site in **Section 15.3.1**.

Table 15.2: RMP/SMR sites near the proposed development site

RMP No.	Class	Townland	ITM
DU013-010001 & -010003	Church & Graveyard	BUZZARDSTOWN	707073 741246
Description: This church (in ruins), with its surrounding graveyard, is situated on a height overlooking the road with a commanding view in all directions, particularly to the west towards Co. Meath and the proposed development area. The church is dedicated to the Blessed Virgin. The church is built of limestone and is not elaborate. It consists of three parts, a nave (with doorway at the north), a chancel and the lower portion of a vaulted tower at the west. The south wall contains a window, made of re-used masonry pieces, and the bottom of a projecting turret. The graveyard, although not formally enclosed, is circular on the west side and squared off at the north, east and south sides. It contains 18th, 19th century and modern gravestones as well as a number of re-used architectural fragments. The graveyard has been extended to the north twice. The graveyard was previously surveyed by Egan in 1993 (Fingal Historic Graveyards Project 2008). *Distance from proposed development site*: c. 22m (graveyard) and c. 14m (church) to the south-east			

RMP No.	Class	Townland	ITM
DU013-009	Ritual site – holy well	TYRRELSTOWN	706926 741013
Description: This well site is known as Lady's well and appears to be associated with the church of the Blessed Virgin, which is located some 300m to the north. The well is located on the western side of Church Road – north of Mulhuddart Village. The well is recorded in the eighteenth century as being frequently visited, especially on the feast of the nativity of the Virgin (8th September). A low wall is built around the water source and on each side of the end wall is an inscription; there is also a statue of the Virgin and the well appears to be still in use. This vaulted well-house stands by the roadside and is approached by stone steps. On the roof are two finials, one a stone carved with a cross in relief and the other a stone niche with an inscription. It is still venerated. Water from the well allegedly cures sprains, cuts, bruises and rheumatism (www.Duchas.ie, Schools Manuscript Vol. 791). *Distance from proposed development site*: c. 235m south			
DU013-006	House – 16th / 17th century	TYRRELSTOWN	706703 741900
Description: Tyrrelstown House occupies the site of a mid-17th century house built by the Bellings family (Ronan 1937). Named on the Down Survey (1655-6) map and described in the Civil survey (1654-6) as 'the walls of a great stonehouse' (Simington 1945). It had been damaged in the 1641 Rebellion leaving only the walls remaining. It presents as a detached five-bay two-storey house, c.1820, attached to earlier two-storey house, c.1720, to rear. A farmyard complex is located to the rear of the house from, c.1820 onwards. *Distance from proposed development site*: c. 440m north-west			

Figure 15.14 Recorded monuments (RMP / SMR) within c. 500m of the proposed development site (in red)



15.3.8 Architectural Heritage

There are no protected structures, National Inventory of Architectural Heritage (NIAH) sites, or features of architectural heritage merit within the proposed development site. The Record of Protected Structures (RPS sites) comprises schedules of buildings and items of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest that are listed for protection. In addition to this, the NIAH was consulted for additional information regarding the architectural heritage of the area. The building survey of Fingal was carried out in 2001 and highlights a representative sample of architecturally significant structures and raises awareness of the wealth and diversity of architectural heritage in the county.

Fingal County Council Development Plan 2023-2029 records four protected structures within c.500m of the proposed development (**Figure 15.15, Table 15.3**), all of which correspond to the RMP sites discussed in **Section 15.3.4**. The nearest of these is Mulhuddart Church and Graveyard (RPS Ref 670) and the remaining two are Lady's Well (RPS Ref 671) and Tyrrelstown House (RPS Ref 673). As these are also recorded archaeological monuments, they are discussed in detail above. The NIAH registers the

graveyard (Reg. No. 11346003), the holy well (Reg. No. 11353010), and Tyrrelstown House (Reg. No. 11346002).

The proposed development lands were formerly part of lands associated with Tyrrelstown House (NIAH Garden Survey ID 2249).

Belcamp Hall bridge (Reg. No. 11350040) appears in the online heritage mapping c. 245m to the south of the proposed development site, but it is an erroneous location, being the bridge located in Balgriffin, North County Dublin (https://maps.archaeology.ie/HistoricEnvironment).

Figure 15.15 Protected structures and NIAH within c. 500m of the proposed development site (in red)

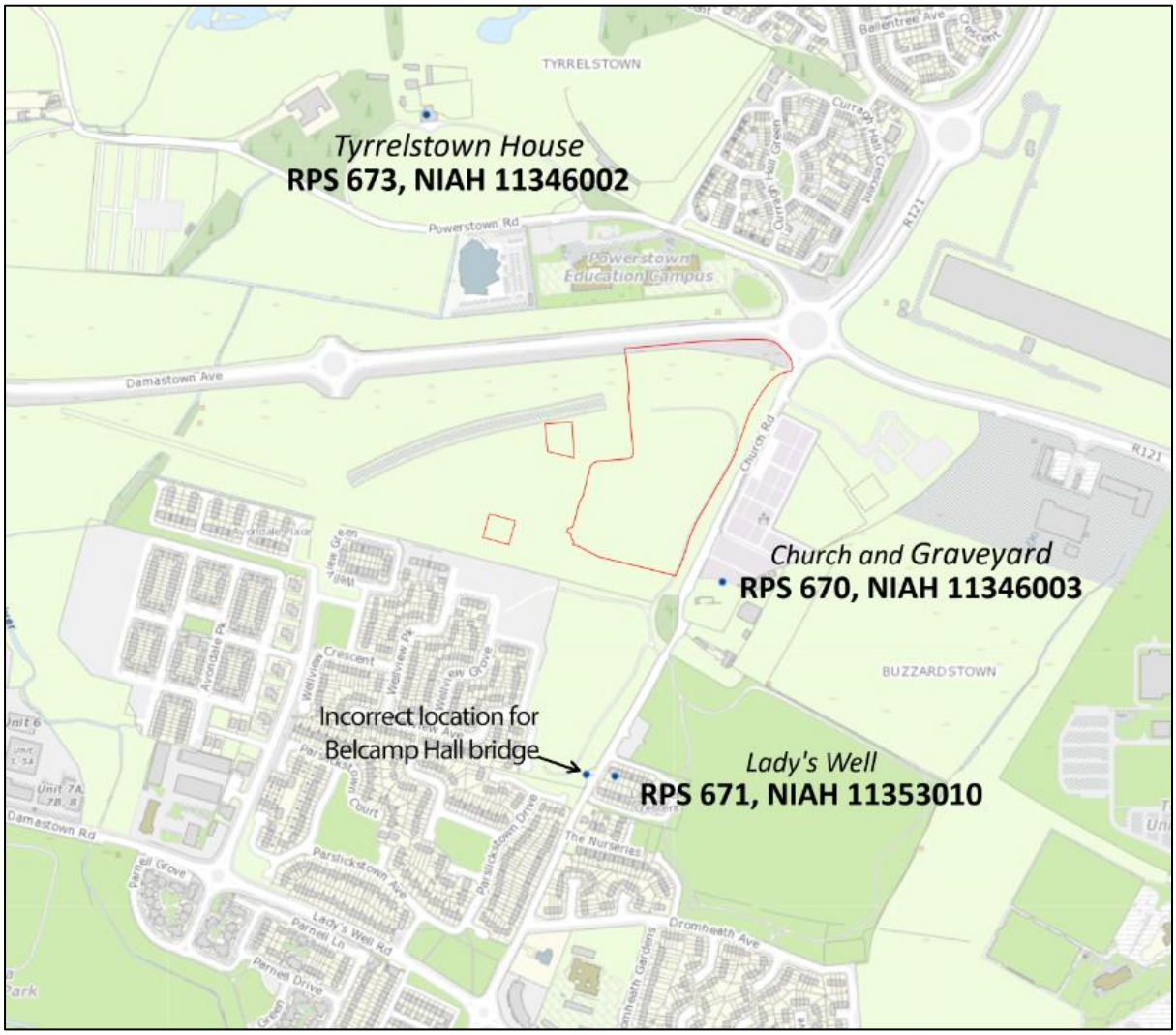


Table 15.3: RPS / NIAH sites near the proposed development site

RPS / NIAH Ref. No.	Site Name	Image	Description / Distance
RPS 671, NIAH 11353010	Lady's Well		Rubble stone corbelled roof structure surrounding holy well, c.1700, with inscribed stone to gable. Isaac Butler wrote in 1740 about the well and the great Pattern that would occur yearly at it. Located c.235m south of the proposed development.
RPS 670, NIAH 11346003	Mulhuddart Church / Graveyard		Graveyard with various cut stone grave markers from c.1300 to present. Rubble stone church, c.1700, now in ruins. Located c. 22m (graveyard) and c. 14m (church) to the south-east of proposed development.
RPS 673, NIAH 11346002	Tyrrelstown House		Detached five-bay two-storey house, c.1820, with nap rendered Ionic portico. Attached to earlier two-storey house, c.1720, to rear. Farmyard complex, c.1820 to rear. Located c.440m northwest of the proposed development.
NIAH Garden Survey ID 2249	Tyrrelstown House		Proposed development lands were formerly part of lands associated with Tyrrelstown House.

15.3.9 Field Inspection

The playing field that makes up the majority of the south and central portions of the proposed development site are level, well-maintained grassed pitches, entered off Church Road (**Plate 15.1**). Beyond the pitches to the north and west the ground is rough under foot and overgrown. Berms around the sides of the field were presumably created by the scarped-out earth that resulted from the levelling of the pitches.

The western boundary of Church Road is comprised of mature trees and hedgerow, which provides good screening between the proposed development site and the nearby church and graveyard (RMP DU013-010, RPS 670). It was possible to see into the proposed development site from the church, which is on an elevated site, through a gap in the tree-line (**Plates 15.2** to **15.4**). This gap was present on the first edition OS map and may have represented the point at which a laneway shown on Rocque's earlier map leading from Tyrrelstown House to the church ended. As the laneway connected both church and house, the present gap preserves the visual connection from the church into the former demesne. The mature treeline along Church Road provides a reminder of the former tree-lined boundaries associated with the demesne lands of Tyrrelstown House (located to the north of the proposed development lands) and enhances to the historic character of the area.

Plate 15.1 View from the northeast looking at the playing field and southern boundary

Plate 15.2 Mulhuddart Church (RMP DU013-010001-003, RPS 670)

Plate 15.3 View to Church Road and the site from Mulhuddart Church

Plate 15.4 Mature trees lining Church Road to the east

15.4 Predicted Impact of the Proposed Project

15.4.1 Archaeological and Cultural Heritage

No significant negative impacts were identified in relation to the proposed development.

There are no designated heritage assets located within the proposed development site and the closest archaeological monument and protected structure is Mulhuddart church and graveyard (DU013-010001-003, RPS 670), which lies on the other side of Church Road, c. 22m to the south-east. This cemetery and church serviced many of the prominent estates in the area and a path led from the church to Tyrrelstown House (DU013-006, RPS 673), traversing through the proposed development area. This laneway was noted on Rocque's map of County Dublin, 1760, and Taylor's map of Dublin, 1816.

The laneway appears to have been out of use by the first edition six-inch Ordnance Survey (OS) map, in 1835, however a gap in the treeline shown on the map (which survives today) is potentially the remnants of the end of this laneway. Monitoring at new school buildings to the north of the proposed development (Licence No. 15E0510) failed to identify any remains of this former trackway (even though it passed through that land parcel as depicted from historic mapping) and perhaps suggests that this feature may not have left any below ground remains.

The mature trees along Church Road forming the eastern boundary of the proposed development site, previously formed an important element of the former demesne landscape of Tyrrelstown House and provide a reminder of the historical character of the area. The creation of a Linear Park, as part of the permitted development to the south, will maintain a green and open space preserving the views to the west from Mulhuddart Church and graveyard. This will have a positive impact on the setting of the recorded monument.

Historically, the proposed development lands were part of a network of fields used for agricultural purposes, however in recent years, the northern and south-western sections have been extensively disturbed as a result of roadworks, temporary haul roads and service insertion and in areas the ground level has been artificially raised due to the dumping of spoil, resulting in it becoming a wasteland. The central and southern portions of the site, which have been in use as playing fields, are very level suggesting a degree of landscaping prior to their use in this context (berms around the sides of the field were presumably created by the scarped-out earth). The results of ground investigations works identified made-ground deposits to a depth of at least 1.8m in places. This indicates significant ground level alteration has taken place. Recent aerial imagery suggests there may also have been previous disturbances in the northern half of the field.

With the exception of a single pit found in Buzzardstown, none of the archaeological investigations in the surrounding area, including those adjacent to the church and graveyard, revealed anything of archaeological interest.

15.4.2 Do-Nothing Impact

In the 'do-nothing' scenario the proposed site would not be redeveloped and therefore there would be no adverse impacts to any as yet undiscovered subsurface archaeological deposits, features or finds, nor to any features of architectural heritage, cultural heritage, or historic interest.

15.4.3 Construction Phase

There is the potential that previously unknown archaeological deposits, features or finds may survive subsurface within the proposed development site, although this potential may have been reduced by previous ground disturbances. This notwithstanding, the potential is at its highest in the central / south part of the proposed development site (the playing field), which is closest to the church and graveyard.

15.4.4 Operational Phase

All physical archaeological, architectural and cultural heritage impact issues will be resolved at the pre-construction stage of the development and therefore no potential negative impacts are envisioned at the operation stage of the development.

The setting of Mulhuddart Church and Graveyard (DU013-010001-003, RPS 670) will be largely screened from the proposed development by the existing tree-lined boundary along Church Road. The creation of a linear park along the south side of the proposed development, as part of the permitted

development, represents a positive, moderate and long-term impact to the setting of the church and graveyard at Mulhuddart and of benefit to the local community as a managed amenity area. This will be enhanced by the retention of the existing mature tree line on Church Road, which adds to the historic character of the area.

The existing gap in the mature treeline, which represents a historic visual connection between Mulhuddart church and the Tyrrelstown estate, will not be affected by the proposed development.

15.5 Mitigation Measures

15.5.1 Construction Phase

The degree of disturbance in the central / south part of the proposed development site (the playing field) is uncertain, however, the results of ground investigations works identified made-ground deposits to a depth of at least 1.8m in places. This indicates significant ground level alteration has taken place. Given its proximity to the church and graveyard, there is potential for associated features to be present in this area. Archaeological testing will take place to establish the degree of disturbance in this part of the site and to assess the survival of any archaeology within the site.

Given the difficulties of examining the below-ground archaeological potential of the lands in the northern and south-western portions of the site due to the extensive disturbance, it is considered that archaeological monitoring is an appropriate mitigation measure here. Archaeological monitoring of ground disturbance works will be carried out under licence to the National Monuments Service of the Department of Housing, Local Government and Heritage (DHLGH). This will ensure the full recognition of, and – if required – the proper excavating and recording of all archaeological features, finds or deposits which may lie undisturbed beneath the ground surface.

All recommendations in this chapter are subject to approval of the National Monuments Service of the DHLGH and Final County Council. As the developer of these lands, Fingal County Council will make provision to allow for and fund whatever archaeological work may be required at the site and the post excavation requirements in accordance with the National Monuments Legislation (1930–2004).

The attention of Fingal County Council is drawn to the relevant portions of the National Monuments Acts (Appendix 15.1), which describes the responsibility of the site owners to report the finding of archaeological items if any should be discovered during construction works to the National Museum of Ireland (Irish Antiquities Division) and the National Monuments Service of the DHLGH who will determine the nature and extent of any archaeological work to be carried out on site.

15.5.2 Operational Phase

The operational phase of the development will have no impact on the cultural heritage environment of the area, as it is anticipated that any impact to archaeological, architectural and cultural heritage features would be encountered at the site preparation stage and resolved prior to the operational phase. As such, no remedial or reductive measures are required for the operational phase.

15.6 Residual Impacts

No residual impacts were identified during the assessment process.

15.7 Monitoring

There will be no requirement for monitoring post-construction.

15.8 Reinstatement

There will be no requirement for reinstatement.

15.9 Interactions

Interaction with Chapter 9 Land, Soils, Geology and Hydrogeology was undertaken to identify indications of previous disturbance within the proposed development site. No other future interactions were identified as part of the assessment.

15.10 Cumulative Impacts

No cumulative impacts were identified in relation to the proposed development and the adjacent permitted developments.

15.11 Difficulties Encountered

No difficulties were encountered during the assessment process.

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15.12.1 Online Resources

www.archaeology.ie (the Historic Environment Viewer)

www.buildingsofireland.ie (NIAH of Fingal)

www.excavations.ie (Archaeological assessment that have taken place from 1970-2020)

www.heritagemaps.ie (showing the location of former archaeological investigations)

www.osimaps.ie (former OS mapping)

www.fingal.ie (Fingal Historic Graveyard Project)

www.duchas.ie (Irish Folklore Commission Schools Manuscript Collection, Volume 790)

Google Earth Pro (showing historic aerial imagery of the area from 1995 onwards)

16 Microclimate – Daylight & Sunlight

16.1 Introduction

This chapter describes the impact assessment undertaken in relation to daylight and sunlight for the proposed development. For a more detailed account of the daylight and sunlight analysis, refer to Waterman-Moylan Engineering's report, 'Church Fields East, Mulhuddart, Dublin 15: Daylight and Sunlight Assessment', submitted under separate cover as part of the planning application.

The proposed development has been assessed using a number of qualitative and quantitative methods to identify the areas of the development which were likely to receive the least daylight and to identify measures that could be taken to improve the daylight penetration. An assessment of the adjacent permitted Part 8 properties was also undertaken in order to identify possible impacts from the proposed development.

This chapter has been prepared by Niall Coughlan and Andrew Cruise of Waterman-Moylan. Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

16.2 Method

16.2.1 Relevant Standards & Guidelines

The Daylight and Sunlight assessment follows the guidelines and methodologies set out in the Building Research Establishment's (BRE) publication entitled "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice – Third Edition 2022*" (hereinafter referred to as BR 209-2022). The 2022 Third Edition supersedes the previously issued 2018 document and aligns the BRE methodology with the methodology that is set out in EN-17037: 2018 + A1: 2021 Daylight in Buildings.

The EN 17037:2018 + A1: 2021 standard—which is the basis of both the 2018 British EN Standard and the 2018 Irish EN Standard – considers a metric based on illuminance, in order to ensure both extent and a degree of uniformity of daylight.

"A space is considered to provide adequate daylight if a target illuminance level is achieved across a fraction of the reference plane within a space for at least half of the daylight hours."

The 2018 British Standard includes a *"National Annex"*, containing *"Further recommendations and data for daylight provision in the UK and Channel Islands"*. As there is no equivalent in the 2018 Irish Standard, regard has been had to the 2018 British Standard National Annex, which states:

"NA.1 Introduction: The UK committee supports the recommendations for daylight in buildings given in BS EN 17037:2018; however, it is the opinion of the UK committee that the recommendations for daylight provision in a space (see Clause A.2) may not be achievable for some buildings, particularly dwellings. The UK committee believes this could be the case for dwellings with basement rooms or those with significant external obstructions (for example, dwellings situated in a dense urban area or with tall trees outside), or for existing buildings being refurbished or converted into dwellings. This National Annex therefore provides the UK committee's guidance on minimum daylight provision in all UK dwellings."

The Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2022 and the assessments discussed in this report will be based on the methods identified

in BRE Guide 209-2022 Edition (June 2022), which are, in turn, based on the EN 17037:2018 + A1: 2021 standard.

The 2022 Apartment Guidelines state that:

"6.5 The provision of acceptable levels of natural light in new apartment developments is an important planning consideration as it contributes to the liveability and amenity enjoyed by apartment residents. In assessing development proposals, planning authorities must however weigh up the overall quality of the design and layout of the scheme and the measures proposed to maximise daylight provision with the location of the site and the need to ensure an appropriate scale of urban residential development."

"6.6 Planning authorities should avail of appropriate expert advice where necessary and have regard to quantitative performance approaches to daylight provision outlined in guides like A New European Standard for Daylighting in Buildings IS EN17037:2018, UK National Annex BS EN17037:2019 and the associated BRE Guide 209 2022 Edition (June 2022), or any relevant future standards or guidance specific to the Irish context, when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision."

"6.7 Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specifics. This may arise due to design constraints associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution."

The BR 209-2022 sets out a number of key parameters and assessment methodologies that should be measured in order to assess the sunlight & daylight penetration into the buildings within a proposed development and also sets out the analysis that should be carried out to assess the impact of a proposed development might have on existing adjacent properties.

The BR 209-2022 Guidelines states that:

"This guide gives advice on site layout planning to achieve good sunlighting and daylighting, both within buildings and in the open spaces between them. It is intended to be used in conjunction with the interior daylight recommendations for new buildings in the British Standard Daylight in buildings, BS EN 17037. It contains guidance on site layout to provide good natural lighting within a new development; safeguarding of daylight and sunlight within existing buildings nearby; and the protection of daylighting of adjoining land for future development."

BR 209-2022 states that:

"1.6 The guide is intended for building designers and their clients, consultants, and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design (see Section 5). In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings. Alternatively, where natural light is of special importance, less obstruction and

hence more sunlight and daylight may be deemed necessary. The calculation methods in Appendices A and B are entirely flexible in this respect. Appendix F gives advice on how to develop a consistent set of target values for skylight under such circumstances."

"1.7 The guidance here is intended for use in the United Kingdom and in the Republic of Ireland, though recommendations in the Irish Standard IS EN 17037 may vary from those in BS EN 17037. Many of the principles outlined will apply to other temperate climates. More specific guidance for other locations and climate types is given in BRE Report Environmental site layout planning."

As a result, if a situation arises where the goals set out in the BR 209-2022 guide are not met, they should be emphasized and either justified in light of the development that is being considered, or, if appropriate and available, compensatory actions will be suggested. The BRE 209-2022 does not, however, set rigid requirements that must be met in every situation. Any variations from the BRE 209-2022 recommendations have thus been noted in the context of the analysis of daylight and sunlight, with the overall goal of ensuring that good quality daylight / sunlight is obtained through analysis and design improvements to the extent possible and viable.

The documents used in assisting the daylight / sunlight assessment are listed below.

- *Sustainable Urban Housing: Design Standards for New Apartments (December 2022) (the "2022 Apartment Guidelines"). These are guidelines issued under section 28 of the 2000 Planning and Development Act (as amended);*
- *The Building Research Establishment's (BRE) Site Layout Planning for Daylight and Sunlight: A guide to good practice (BR 209) 3rd edition/ 2022 edition, (the "BRE Guide");*
- *British Standard BS EN 17037:2018 – Daylight in Buildings (the "2018 British EN Standard");*
- *Irish Standard IS EN 17037:2018 (the "2018 Irish EN Standard").*

16.2.2 Overview of Daylight & Sunlight Analysis

The assessment methodology for the various aspects of the daylight and sunlight analysis is summarised in Table 16.1, below.

A three-dimensional digital model of the proposed development and adjacent properties in the permitted Part 8 development was constructed by Waterman-Moylan based on drawings supplied by the Design Team, and with reference to satellite and aerial photography. In assessing the impact of the proposed development on the permitted Part 8 properties, where relevant, assumptions were made as to the materials and reflectance of external surfaces.

Table 16.1 Daylight & Sunlight Methodology and Guidelines

	Element	Methodology	Guidelines
Daylight	Proposed development	Illuminance	BR 209-2022
	Existing neighbouring buildings	Vertical sky component	BR 209-2022
Sunlight	Proposed development amenity spaces	Sunlight hours	BR 209-2022
	Proposed development	Exposure to Sunlight	BR 209-2022
	Existing neighbouring buildings	Annual probable sunlight hours	BR 209-2022
	Existing neighbouring amenity spaces (gardens)	Sunlight hours	BR 209-2022

16.2.3 Glossary

- **Illuminance:** Target illuminance levels are provided within BR 209-2022 which correspond to the values identified in EN 17037. There is also an Annex included which identifies targets that are deemed to be satisfactory for the United Kingdom, these UK specific targets are lower than those identified in the EN standard.

  BR 209-2022 (and EN 17037) identify two target values for illuminance that should be satisfied in order for a room to be considered adequately daylit.
  - Target illuminance (ET) should be achieved across at least half of the reference plane in a daylit space for at least half of the daylight hours.
  - Minimum target illuminance (ETM) should also be achieved across 95% of the reference plane for at least half of the daylight hours.

- **Annual probable sunlight hours:** Annual probable sunlight hours (APSH) and winter probable sunlight hours (WPSH) are used for the assessment of impact on neighbouring buildings by a proposed development. APSH and WPSH are a measure of probable direct sunlight to a window or surface and, therefore, are only relevant to windows within 90 degrees of south for buildings in the northern hemisphere. Therefore, any window with a northerly aspect (i.e. orientated between North and East and North and West) is, therefore, not assessed within the methodology;

- **Daylight Factor (DF):** The proportion of a point's illumination in a room caused by both direct and indirect light from the sky over that point's illumination on an exterior horizontal plane based on an unobstructed sky. Direct sunlight is not included in the definition of daylight factor used here. The (theoretical) CIE Overcast Sky is used for ADF and MDF assessments because it is unidirectional, meaning that a window facing north will theoretically receive the same amount of light as one facing south, etc.

- **Vertical sky component (VSC):** The Vertical Sky Component (VSC) is the ratio of direct sky illuminance that falls on a vertical wall at a particular reference point to the simultaneous horizontal illuminance under an unobstructed sky. The maximum VSC is typically 40% for an unobstructed wall. The assessment of VSC assumes that the sky is completely overcast (CIE Overcast Sky), with no direct sunlight. As the sky model brightness is assumed unidirectional, there is therefore no difference in calculation for VSC for different orientations: i.e., Northerly aspect facades will receive identical natural light potential to Southerly, etc.

  The Angle of Visible Sky and the VSC are effectively different ways of representing the same information, both will allow an assessment to be made of the day light available at a point on a building façade, and by extension the likelihood of adequate daylight being available within the rooms of a building, however they do not provide a method for measuring the specific internal daylight levels.

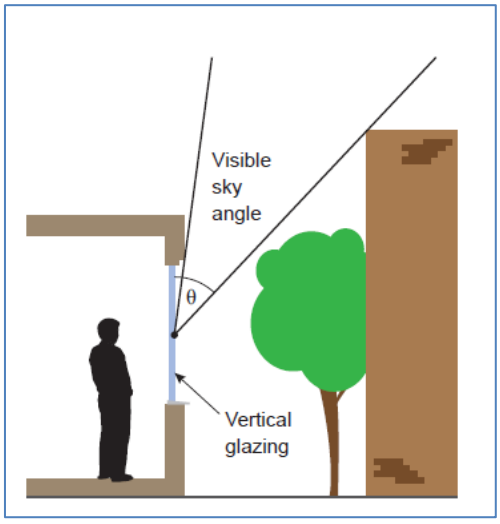
- **Sunlight to Amenity:** BR 209-2022 recommend that for external amenity spaces to appear adequately sunlit throughout the year, at least 50% of the amenity space should receive at least two hours of sunlight on March 21st. As the 21st March is the solar equinox, the sun is at its mid-

point of travel position through the year, therefore representing an average condition throughout the year of how well sunlit an amenity space will be.

16.2.4 Daylight

16.2.4.1 Proposed Development

The daylight analysis accounts for all aspects that can potentially restrict natural light availability including any adjacent / opposing buildings, balcony structures, window frames / sills, etc. The distribution of daylight within a space can be affected and impact on the overall amount of daylight received.



The Angle of Visible Sky can be used to provide a qualitative assessment of the amount of daylight that can be expected based on the angle between the mid pane of the window a continuous obstruction opposite to it.

16.2.4.2 Permitted Part 8 Buildings

The BR 209-2022 guidance suggests that analyses of the impact of new developments on existing adjacent properties should be considered. To assess the potential impacts of a new structure or structures the report identifies a number of conditions that can be assessed, to determine if further detailed numerical daylight analysis is required.

The guidance suggests that if either of the following criteria are met that the development can be deemed to have no discernible impact on the daylight levels of the existing building.

- If the distance of each part of the new development is three or more times greater than its height above the midpoint of the window in the existing property or
- If the angle from the horizontal between the mid pane of a window of the existing dwelling and the highest point of the new structure is less than 25 degrees

The permitted Part 8 buildings are a considerable distance from the site boundary and the 25 degree criteria referred to above is likely to be met in most cases. This would give confidence that the proposed development will have a negligible impact on the neighbouring properties. Nonetheless, a modelling

exercise has still been undertaken to confirm that the impact of the proposed development is indeed negligible.

The assessment is based on measuring the VSC at the window receptor point as outlined in the Daylight / Sunlight Report. The results of this assessment indicated a minimal degree of impact on the existing neighbouring buildings from the proposed development.

16.2.5 Sunlight

The BR 209-2022 Guide provides guidance with regards to sunlighting and shading to external amenity spaces within proposed developments as follows:

> *"… that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21st March".*

The methodology assesses sunlight performance between spaces and around buildings. This has a crucial impact on the overall appearance and feel of the surrounding environment, including that the following attributes will be achieved:

- Provide attractive sunlit views (all year);
- Make outdoor activities like sitting out and children's play more pleasant (mainly warmer months);
- Encourage plant growth (mainly spring and summer); and
- Dry out the ground, reducing moss and slime (mainly in colder months)
- Melt frost, ice and snow (in winter); and
- Dry clothes (all year)

Waterman-Moylan performed sunlight analysis on the proposed amenity spaces using drawing information as received from Walsh Architects, and utilising IES VE software.

16.2.5.1 Permitted Part 8 Buildings

The impact on sunlight availability to permitted Part 8 buildings can be assessed utilising a quantitative assessment method as detailed in the BR 209-2022 Guide, which states that:

> *"If a living room of an existing dwelling has a main window facing within 90° of due south, and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected. This will be the case if the centre of the window:*
>
> - *Receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21 September and 21 March and*
> - *Receives less than 0.8 times its former sunlight hours during either period and*
> - *Has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours."*

In relation to the assessment of impacts on sunlight availability to existing neighbouring amenity spaces, the BR 209-2022 guide states the following:

> *"It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area that can receive two hours of sun on 21 March is less than 0.80 times its former value, then the*

loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March."

Diagrams of the site shade were created to show any potential overshadowing of nearby developments. For the Solstices of Summer and Winter, they were created on an hourly basis. These allow calculation of the number of hours the location will have access to sunlight on March 21, the equinox.

Waterman-Moylan's scoping analysis indicates that the proposed development will result in no significant change in sunlight access within neighbouring existing buildings and amenity spaces.

16.2.6 Assessment of Impacts

This Chapter and assessment have been completed having regard to the guidance outlined in the Environmental Protection Agency (EPA) documents *'Guidelines on information to be contained in Environmental Impact Assessment Reports'* (May 2022) (the 'EPA Guidelines'); and to Directive 2011/92/EU (as amended by Directive 2014/52/EU) on the assessment of the likely effects of certain public and private projects on the environment.

Table 16.2 below provides the list of definitions for describing the significance of effects given in Table 3.4 of the EPA Guidelines and comments on what these definitions imply in the case of daylight / sunlight access.

Table 16.2 EPA Description of Effects and Interpretations

Effect	Definition (EPA, 2022)	Interpretation in terms of daylight / sunlight access
Imperceptible	An effect capable of measurement but without significant consequences	According to the definition, the development would result in a change in the amount of daylight and sunlight that a location receives that could be measured but would not be apparent to a casual observer. There might not be an impact if the development did not alter daylight and sunlight access.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences	According to the definition, the project would alter the amount of daylight and sunlight that an area receives, and that change could be measured and noted by a person who is actively interested in how proposed development would affect daylight and sunlight availability.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities	In order for this definition to be applicable, the development's construction would have to alter the amount of daylight and sunlight that a location receives in a way that is both quantifiable and hardly perceptible. However, a building that is already in place should keep much of its current daylight and sunlight environment.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends	The daylight and sunlight environment within an existing building must change in this scenario, and the change must be consistent with a pattern of change that is presently present, is expected to be present, or is anticipated by policy. Where additional developments were causing changes in solar access of a comparable

Effect	Definition (EPA, 2022)	Interpretation in terms of daylight / sunlight access
		magnitude in the area, a modest effect would take place.
Significant	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment	According to the criteria, the presence of the development would alter how much daylight and sunlight is available in a way that is not "consistent with existing and emerging baseline trends." For instance, a development that causes a "significant" reduction in sunlight access would lessen it to the point where basic requirements for sunlighting are not reached and some of the day would need to be spent using artificial lighting.
Very significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment	According to the criteria, the presence of the development will significantly alter the amount of sunlight availability in a way that is not "consistent with existing and emerging baseline trends." For instance, a "very significant" effect might happen if a development caused the amount of sunlight entering a room to fall significantly below the minimal requirements for sunlighting, necessitating the constant use of artificial lighting as the primary source of illumination in that space.
Profound	An effect which obliterates sensitive characteristics	Development that facilitates sunlight access to a room in an existing building where the existing room does not currently have any (for example, as a result of the demolition of a building) or by eliminating all access to sunlight within an existing building are examples of development that results in a "profound" effect on daylight and sunlight access.

It is feasible that development could have a beneficial impact on sunlight access, but this implies that development would entail a reduction in the size or scale of constructed form (for example, reducing the number of apartment storeys could boost sunlight access). Even if it is possible, it is typically improbable because the majority of development entails the creation of new barriers to sunlight access.

16.3 Baseline Environment

A description of the receiving environment is provided in Section 1.3.1 in Chapter 1 (Introduction) of this EIAR. Refer also to **Figures 1.1** and **1.2** in Chapter 1.

The Irish Meteorological Service, Met Éireann, has figures that show May and June are the sunniest months. The greater Dublin area experiences a mean daily length of 1.7 hours of sunlight in December, which is only 22% of the daily potential of 7.4 hours of sunlight. This can be contrasted to the average daily duration of 6.4 hours of sunlight that Dublin experienced in June, which is 38% of the daily potential of 16.7 hours of sunlight.

As a result, overshadowing effects are typically more apparent during the summer and less apparent during the winter. Midwinter's low sun angle results in a generally dense shadow environment throughout all urban and suburban locations.

The daylight and sunlight assessments identified some areas that were likely to receive poor daylight penetration. These areas include the northern façade of the apartment blocks, rooms impacted by balcony overhang and areas blocked from direct sunlight by surrounding structures.

In order to improve daylight penetration measures including increased window sizes and reduced balcony overhang were designed into the apartment blocks with seen significant improvements to the overall daylight received.

The sunlight assessment of the proposed communal amenity spaces, public open spaces and pocket parks identified satisfactory levels of sunlight exposure with over 50% of these areas received more than 2 hours of direct sunlight on the 21st March in accordance with BR 209-2022.

The impact on the permitted Part 8 properties was minimal with no major disruption to the daylight and sunlight. The vertical sky and annual probable sunlight hours assessments resulted in no significant change to daylight received or probable sunlight hours.

16.4 Predicted Impacts of the Proposed Development

16.4.1 Do-Nothing Impact

In a do-nothing scenario, daylight and sunlight availability in the receiving environment would remain unchanged, as per the baseline conditions.

16.4.2 Construction Phase

The projected development's daylight and sunlight effects during construction are probably going to be less severe than they will be once it is finished. As the projected development nears completion, the effects in this regard are probably going to be indistinguishable from those of the finished development (as determined below). It is noted that temporary equipment and structures (such as hoarding, scaffolding, cranes, etc.) could alter how much sunlight enters buildings, albeit any further effects would only be temporary and not significant.

16.4.3 Operational Phase

16.4.3.1 Daylight

All residential apartment units have undergone an indoor daylight investigation, which evaluated the lighting in both kitchen/living/dining and bedrooms. Based on the daylight / sunlight assessment, it was found that the BRE 209-2022 guidelines for illuminance (lux) were exceeded in 100% of the rooms evaluated.

The effects are considered to be *'not significant'* in relation to Table 3.4 of the EPA Guidelines and the aforementioned Table 16.2 in the case of daylight / sunlight access.

16.4.3.2 Sunlight

Proposed Development Amenity Spaces

The extent of each location that can receive at least 2 hours of prospective sunlight on March 21st was calculated for the proposed development using an analysis of the annual sunlight availability. It was

discovered that the proposed amenity space received exceptional overall sunlight availability. According to the results of the sunlight assessment, every amenity space on the site received at least two hours of sunlight on March 21. This shows that each amenity space can easily comply with BRE guidelines.

The effects are considered to be *'not significant'* in relation to Table 3.4 of the EPA Guidelines and the aforementioned Table 16.2 in the case of daylight / sunlight access.

16.4.3.3 Overshadowing

The overshadowing assessment included in Waterman-Moylan Engineering's report, 'Church Fields East, Mulhuddart, Dublin 15: Daylight and Sunlight Assessment' and shows the various shadows cast on two significant dates (March 21st and December 21st), as well as the potential effects the proposed development might have on the permitted Part 8 properties at different times of the day.

The overall shadowing assessment demonstrates a low impact from the proposed development within the development and on the permitted Part 8 properties.

The proposed development's potential for overshadow on itself has also been assessed. Due to their placements and the sun path, the proposed apartment blocks D, E, and F will have little effect on the proposed houses, according to the analysis.

The effects are considered to be *'slight'* in relation to Table 3.4 of the EPA Guidelines and the aforementioned Table 16.2 in the case of daylight / sunlight access.

16.5 Mitigation Measures

There have been no discernible adverse effects associated with daylight or sunlight. Therefore, no additional mitigating measures are proposed in this regard beyond what is already suggested under the scope of the design for the proposed development.

16.6 Residual Impacts

The extent of compliance for daylight and sunlight measurements was attained through an iterative design process that included rearranging unit layouts and façades to maximize the amount of interior daylighting. In conclusion, this study verifies that best practices have been followed to assure sunlight and daylight availability for the proposed development, with the least possible negative effects on the surrounding ecosystem.

16.7 Interactions

Since impacts on daylight and sunlight availability, such as overshadowing of the permitted Part 8 buildings, can either negatively or positively affect residential amenity in the receiving environment, Chapter 7 (Population & Human Health) is where this chapter and other specialized chapters of the EIAR interact most frequently. As mentioned above, there are no anticipated effects on the nearby residential neighbourhoods, and the proposed development itself would offer well-lit residences and amenity facilities.

16.8 Cumulative Impacts

Regard has been given to the list of advancements listed in Chapter 21 (Cumulative Impacts) when writing this chapter. Due to the proximity between the proposed development and any existing developments as well as any foreseeable future developments, there are no expected cumulative effects for daylight and sunlight.

16.9 Difficulties Encountered

The design team did not encounter any significant difficulties in order to conduct a measured building survey. Waterman-Moylan were provided with accurate building information from Walsh Associates which allowed for a high degree of accuracy of the three-dimensional model used to analyse the proposal's influence on daylight penetration and sunlight exposure.

16.10 References

- Sustainable Urban Housing: Design Standards for New Apartments (December 2022) (the "2022 Apartment Guidelines"). These are guidelines issued under section 28 of the 2000 Planning and Development Act (as amended).
- The Building Research Establishment's (BRE) Site Layout Planning for Daylight and Sunlight: A guide to good practice (BRE 209) 3rd edition/ 2022 edition, (the "BRE Guide").
- British Standard BS EN 17037:2018 – Daylight in Buildings (the "2018 British EN Standard").
- Irish Standard IS EN 17037:2018 (the "2018 Irish EN Standard").

17 Traffic & Transportation

17.1 Introduction

This chapter has been prepared by Waterman Moylan Consulting Engineers to assess the likely effects of the proposed development in terms of vehicular, pedestrian and cycle access during the construction and operational phases of the proposed development.

Refer to Table 1.4 in Chapter 1 (Introduction) for qualifications of authors and reviewers.

The chapter describes: the methodology, the receiving environment at the area surrounding the application site, the characteristics of the proposal in terms of physical infrastructure, the potential impact that proposals of this kind would be likely to produce, the mitigation measures required to prevent, reduce or offset any significant adverse effects, and the predicted impact of the proposal examining the effects of the proposed development on the local road network. As part of the subject application, Waterman Moylan has also prepared a Traffic and Transport Assessment (TTA) and a Travel Plan (TP) which are accompanying the documentation package under a separate cover.

17.2 Method

The following methodology has been adopted for this assessment:

- Review of the relevant available information including, the Fingal Development Plan (2023 – 2029), the Greater Dublin Area Transport Strategy (2022 - 2042), the GDA Cycle Network Plan (2022), the Sustainable Urban Housing: Design Standards for New Apartments (2022), the Church Fields Land Management Plan, the Transport Impact Assessment, Church Fields Land Development (2019), the Traffic Assessment, Avondale Park (2019) and the Design Manual for Urban Roads and Streets (DMURS) – 2019.
- Site visit to gain an understanding of the site access and observe the existing traffic situation and receiving environment;
- Description of the proposed development and other relevant (approved/future) nearby developments;
- Detailed estimation of the transport demand to be generated by the proposed and relevant (approved/future) nearby developments. The morning and evening peak times have been addressed as well as an estimation of the construction stag traffic and the Annual Average Daily Traffic (AADT); and
- Assessment of the impact of the generated traffic on local junctions and associated mitigation measures, car parking requirements and accessibility of the site by sustainable modes including walking, cycling and public transport.

17.3 Baseline Environment

This section considers the baseline conditions of the surrounding area, providing background information to determine the significance of any traffic and transport implications. It also considers the existing accessibility of the site by sustainable modes of transport.

17.3.1 Local Road Network

17.3.1.1 Roads

The site is located between the Damastown Avenue to the north, the Church Road to the east, the Church Fields Link Road (Wellview Avenue) to the west and the Ladyswell Road to the south as shown in **Figure 17.1**.

Church Road is a narrow rural road with a single carriageway road and a greenway facility on the west side of the road, which is currently being upgraded as part of the works approved under Reg. Ref. PART XI/011/19.

Damastown Avenue is a single carriageway road with cycle lanes and footpaths provided on both sides.

Ladyswell Road is a single carriageway local road with grass verges, footpaths, and speed ramps for traffic calming.

Wellview Avenue is a single carriageway cul-de-sac with grass verges, footpaths, and speed ramps for traffic calming. The connection link between Wellview Avenue and the Damastown Avenue (the Church Fields Link Road) is currently under construction (Reg. Ref. PARTXI/011/19: Church Fields Link Road and Cycle Network Development.

The posted speed limit is 50kph on Church Road, Ladyswell Road and Wellview Avenue, increasing to 60 kph on Damastown Avenue.

To the south, Church Road facilitates access to the N3 and M50 motorways and to the north the R121 facilitates access to the N2 Motorway

17.3.1.2 Junctions

There are four existing main junctions in the area of the subject site which have been numbered clockwise from Junction 1 as shown in **Figure 17.1**.

Figure 17.1 Map of Local Road Network and Main Junctions

Junction 1: Church Fields Link Road / Damastown Avenue. Existing two-arm roundabout with an Inscribed Circle Diameter (ICD) of 50 metres and provision for a future third arm (south) and fourth arm (north).

Junction 2: Damastown Avenue / Church Road / Damastown Avenue / Powerstown Road / R121 Cruiserath Road. Existing five-arm roundabout with an ICD of 75 metres and a signal-controlled pedestrian crossing facility on the Damastown Avenue approach (west).

Junction 3: Church Road / Castlecurragh / Ladyswell Road. Existing four-arm roundabout with an ICD of 36 metres.

Junction 4: Damastown Road / Parnell Drive / Wellview Avenue. Existing four-arm roundabout with an ICD of 36 metres.

Junction 5, on Church Fields Link Road will be a four-arm roundabout with an ICD of 24 metres approved as part of the planning permission for the Church Fields Link Road and Cycle Network (Ref. PARTXI/011/19). Junction 5 will provide the vehicular access to the proposed development via the adjacent approved residential development (Planning Reg. Ref.: PARTXI/012/21).

Improvements to Junctions 1, 2 and 4 were also approved under the Church Fields Link Road and Cycle Network project (Ref. PARTXI/011/19).

17.3.2 Baseline Traffic

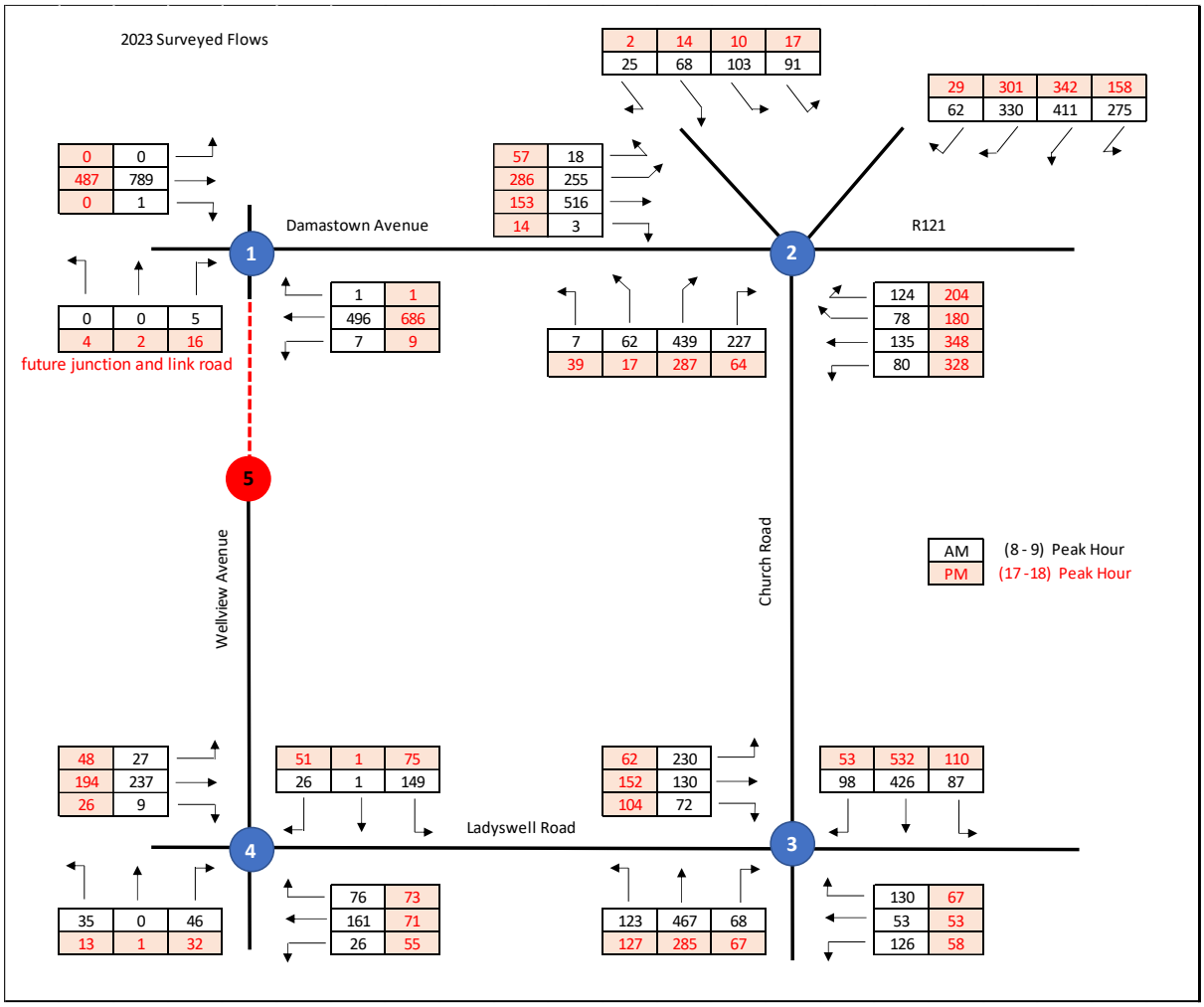
17.3.2.1 Traffic Survey

In order to quantify the volumes of traffic movements at key points on the road network surrounding the site, as part of the Traffic and Transport Assessment (TTA) prepared by Waterman Moylan Consulting Engineers for the subject proposed development (accompanying the documentation package under a separate cover), a 24-hour traffic survey was carried out at the four existing junctions (Junctions 1 to 4) outlined above. Junction 5 is an approved roundabout which is currently under construction.

The 24-hour traffic survey was carried out by 'IDASO' on Tuesday 21st March 2023. A copy is included in Appendix A of the accompanying TTA.

The results of the survey indicated that the peak traffic levels trough the junctions occurred between the hours of 08:00 to 09:00 in the AM and 17:00 to 18:00 in the PM. The surveyed peak hour movements are illustrated in **Figure 17.2**.

Figure 17.2 2023 Surveyed Flows (AM and PM Peak Hours)



17.3.2.2 Annual Average Daily Traffic (AADT)

As recommended in the Transport Infrastructure Ireland (TII) Publication '*Project Appraisal Guidelines Unit 16.1: Expansion Factors for Short Period Traffic Counts (October 2016)*', the traffic count data has been converted to Annual Average Daily Traffic (AADT) data in order to provide a dataset representative of the annual traffic flow profile for the road network surrounding the proposed development.

The General Expansion Factor Method, as outlined in the TII Publication, was used to convert the surveyed flows into AADT. The corresponding factors for the Dublin Region were used (set out in Appendices B and C of the TII Publication).

Table 17.1 AADT Calculations – Junction 1

Hour Ending	Proportion of Daily Traffic	Surveyed Flows (Vehicles 2-way)	Hour Ending	Proportion of Daily Traffic	Surveyed Flows (Vehicles 2-way)
01:00	0.008	38	13:00	0.059	482
02:00	0.004	17	14:00	0.062	577
03:00	0.003	10	15:00	0.063	639
04:00	0.004	14	16:00	0.069	819
05:00	0.007	33	17:00	0.083	1124
06:00	0.013	160	18:00	0.088	1211
07:00	0.037	750	19:00	0.075	767
08:00	0.077	1345	20:00	0.054	530
09:00	0.081	1303	21:00	0.039	246
10:00	0.066	828	22:00	0.031	203
11:00	0.055	465	23:00	0.022	124
12:00	0.055	476	00:00	0.014	72
				Junction 1 - Total 24-Hour Flows =	12,233 veh.
				Weekly Average Daily Traffic (WADT) = 12,233 vehicles x 0.94 (Day – Tuesday) =	11,499 veh.
				Annual Average Daily Traffic (AADT) = 11,499 vehicles x 1.02 (Month – March) =	**11,729 veh.**

Table 17.2 AADT Calculations – Junction 2

Hour Ending	Proportion of Daily Traffic	Surveyed Flows (Vehicles 2-way)	Hour Ending	Proportion of Daily Traffic	Surveyed Flows (Vehicles 2-way)
01:00	0.008	107	13:00	0.059	1319
02:00	0.004	61	14:00	0.062	1654
03:00	0.003	44	15:00	0.063	1853
04:00	0.004	44	16:00	0.069	2113
05:00	0.007	93	17:00	0.083	2560
06:00	0.013	341	18:00	0.088	2850
07:00	0.037	1376	19:00	0.075	2031
08:00	0.077	2393	20:00	0.054	1475
09:00	0.081	3309	21:00	0.039	924
10:00	0.066	1821	22:00	0.031	691
11:00	0.055	1170	23:00	0.022	420
12:00	0.055	1225	00:00	0.014	214
				Junction 2 - Total 24-Hour Flows =	30,088 veh.
				Weekly Average Daily Traffic (WADT) = 30,288 vehicles x 0.94 (Day – Tuesday) =	28,283 veh.
				Annual Average Daily Traffic (AADT) = 28,283 vehicles x 1.02 (Month – March) =	**28,849 veh.**

Table 17.3 AADT Calculations – Junction 3

Hour Ending	Proportion of Daily Traffic	Surveyed Flows (Vehicles 2-way)	Hour Ending	Proportion of Daily Traffic	Surveyed Flows (Vehicles 2-way)
01:00	0.008	101	13:00	0.059	1175
02:00	0.004	62	14:00	0.062	1423
03:00	0.003	39	15:00	0.063	1581
04:00	0.004	38	16:00	0.069	1580
05:00	0.007	47	17:00	0.083	1689
06:00	0.013	179	18:00	0.088	1675
07:00	0.037	597	19:00	0.075	1583
08:00	0.077	1105	20:00	0.054	1258
09:00	0.081	2015	21:00	0.039	889
10:00	0.066	1344	22:00	0.031	658
11:00	0.055	980	23:00	0.022	408
12:00	0.055	1054	00:00	0.014	203
Junction 3 – Total 24-Hour Flows =					21,683 veh.
Weekly Average Daily Traffic (WADT) = 21,683 vehicles x 0.94 (Day – Tuesday) =					20,382 veh.
Annual Average Daily Traffic (AADT) = 20,382 vehicles x 1.02 (Month – March) =					**20,790 veh.**

Table 17.4 AADT Calculations – Junction 4

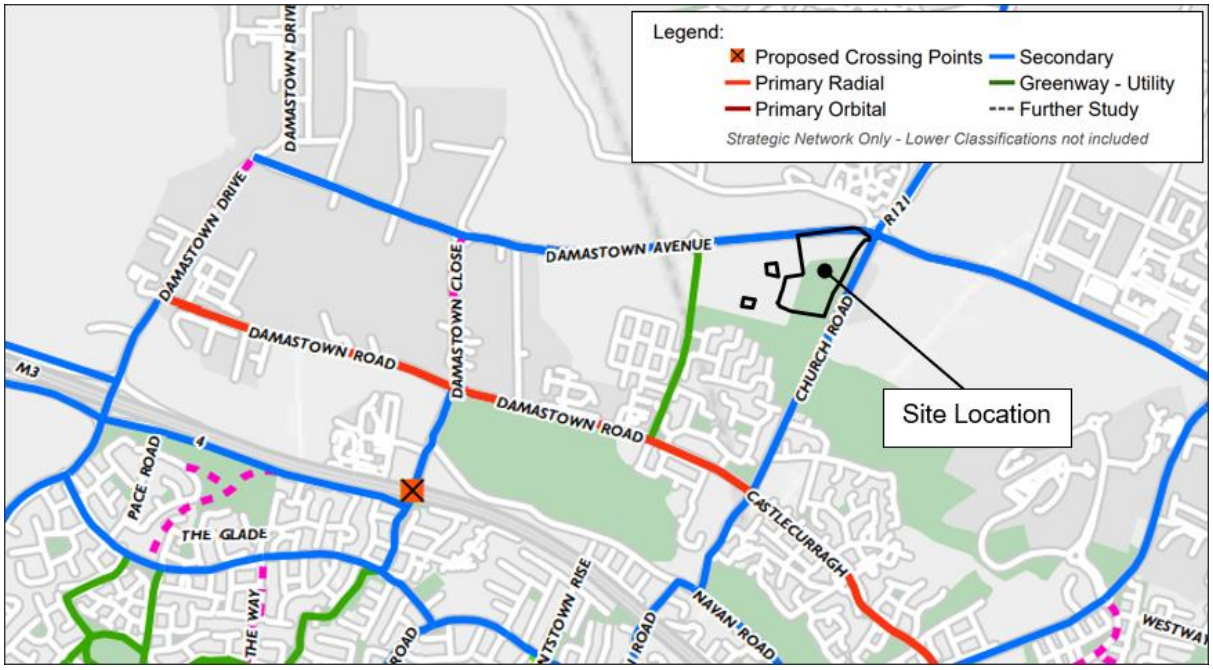
Hour Ending	Proportion of Daily Traffic	Surveyed Flows (Vehicles 2-way)	Hour Ending	Proportion of Daily Traffic	Surveyed Flows (Vehicles 2-way)
01:00	0.008	61	13:00	0.059	481
02:00	0.004	19	14:00	0.062	566
03:00	0.003	11	15:00	0.063	612
04:00	0.004	21	16:00	0.069	568
05:00	0.007	26	17:00	0.083	595
06:00	0.013	103	18:00	0.088	619
07:00	0.037	265	19:00	0.075	522
08:00	0.077	501	20:00	0.054	412
09:00	0.081	829	21:00	0.039	346
10:00	0.066	556	22:00	0.031	242
11:00	0.055	383	23:00	0.022	166
12:00	0.055	443	00:00	0.014	80
Junction 4 – Total 24-Hour Flows =					8,427 veh.
Weekly Average Daily Traffic (WADT) = 8,427 vehicles x 0.94 (Day – Tuesday) =					7,921 veh.
Annual Average Daily Traffic (AADT) = 7,921 vehicles x 1.02 (Month – March) =					**8,079 veh.**

17.3.3 Cycling and Pedestrian Facilities

17.3.3.1 Cycling

In the vicinity of the proposed development site, cyclists can benefit from the provision of cycle lanes along both sides of the Damastown Avenue which continues further east along the R121. A cycleway network, permitted under Ref. PARTXI/011/19, is currently under construction along Damastown Avenue, on Church Fields Link Road and immediately east of the subject site running to the west of Church Road. **Figure 17.3** extracted from the National Transport Authority's (NTA) Greater Dublin Area Cycle Network Plan (2022), illustrates the local cycle network.

Figure 17.3 Cycle Facilities Map – extracted from GDA Cycle Network Plan, 2022



Cycling policies and objectives are also set out in Sections 6.5.6.1 and 6.5.6.2 of the Fingal Development Plan (2023 – 2029). **Figure 17.4** shows indicative cycle routes on Church Road, on Damastown Avenue – continuing along R121 and on Damastown Close.

Figure 17.4 Cycle Network Plan – Fingal Development Plan (2023 – 2029)

17.3.3.2 Pedestrian

Pedestrian facilities in the surrounding area are of reasonable standard. There are well established footpaths along the roads surrounding the site and street lighting is provided. Push button pedestrian crossing facilities are provided on Damastown Avenue at the approach to the roundabout with Church Road.

Pedestrians can also benefit from the provision of a greenway running parallel to and west of Church Road starting at the access to the Mulhuddart Cemetery and running south up until Parlickstown Drive. The upgrade of this greenway to include a two-way off-road cycle track has been approved (and is currently under construction) under the *Church Fields Link Road and Cycle Network* project (Reg. Ref. PARTXI/011/19).

17.3.4 Local Bus Network

The closest bus stops serving the surrounding area are located on Ladyswell Road and on R121 to the south and east of the subject site, respectively. Walking times from the site to these bus stops are shown in **Figure 17.5**. Shortest walking route to the Ladyswell Road bus stops is via the existing greenway and Parslicktown Drive running parallel to Church Road. Shortest walking to the R121 bus stops is via Church Road and R121.

The bus stops on Ladyswell Road are served by the Dublin Bus routes 38, 38A and 38B and by the Go-Ahead routes 220, 220A and 238. The bus stops on the R121 are served by the Dublin Bus routes 40D and the Go-Ahead 236, 236A and 238. The frequencies of which these routes operate are shown in **Table 17.5**.

Figure 17.5 Location of Closest Bus Stops and Routes from the Site

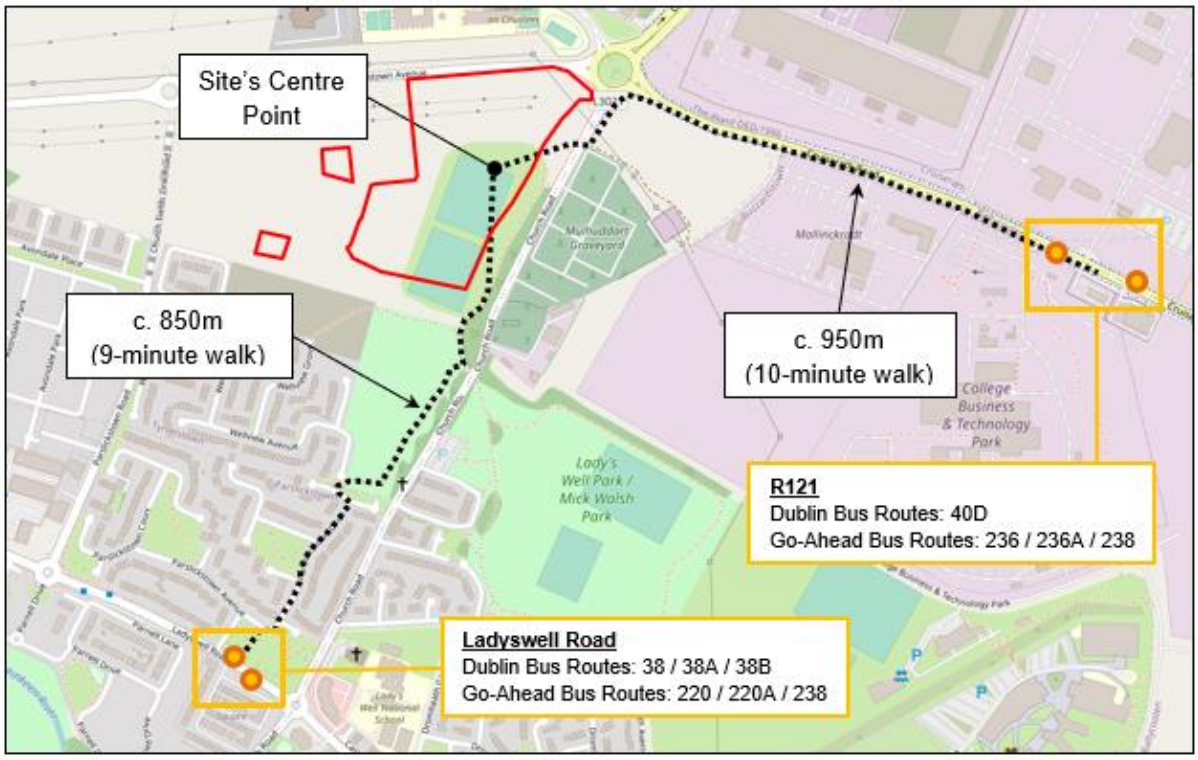


Table 17.5 Local Dublin Bus and Go-Ahead Routes – Weekday Frequencies

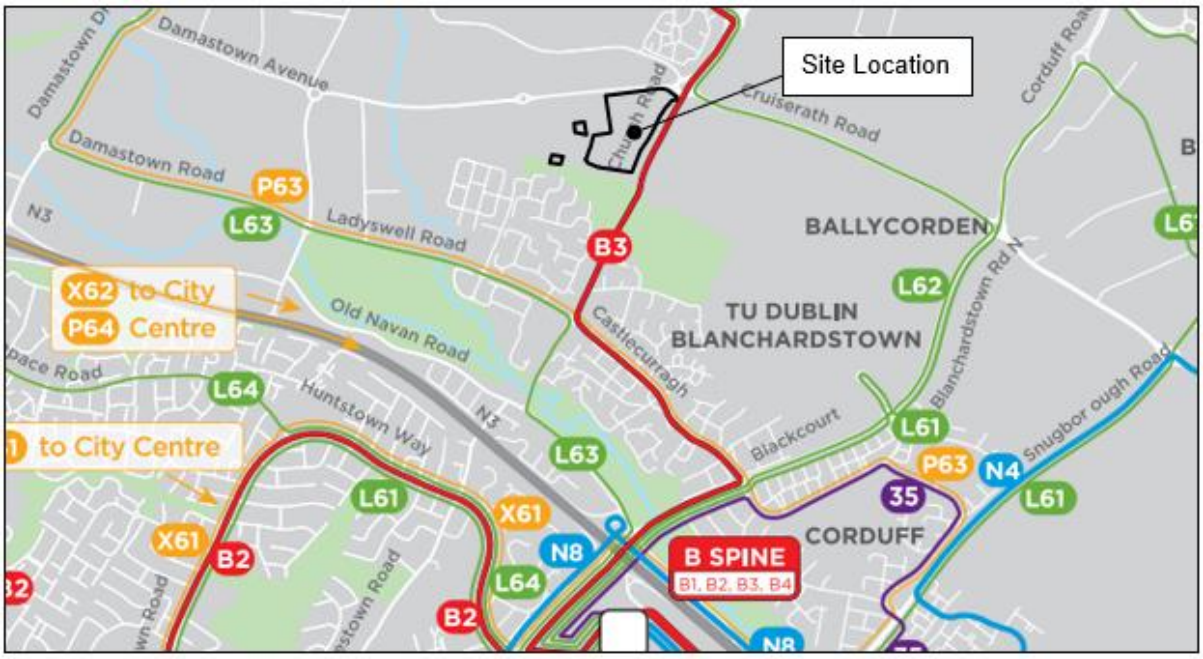
Route	Direction	00h to 07h	07h to 09h	09h to 17h	17h to 19h	19h to 00h
38	Inbound	3 services	5 services	16 services	5 services	9 services
	Outbound	2 services	6 services	17 services	4 services	9 services
38A	Inbound	3 services	6 services	17 services	5 services	8 services
	Outbound	2 services	6 services	16 services	5 services	9 services
38B	Inbound	3 services	3 services	-	-	-
	Outbound	2 services	5 services	-	-	-

Route	Direction	00h to 07h	07h to 09h	09h to 17h	17h to 19h	19h to 00h
40D	Inbound	2 services	9 services	18 services	8 services	9 services
	Outbound	4 services	8 services	18 services	8 services	9 services
220	Inbound	1 service	1 service	7 services	3 services	3 services
	Outbound	1 service	2 services	8 services	2 services	3 services
220A	Inbound	-	1 service	-	-	-
	Outbound	-	-	1 service	-	-
236	Inbound	1 service	2 services	-	-	-
	Outbound	-	-	1 service	2 services	-
236A	Inbound	-	-	2 services	1 service	-
	Outbound	-	2 services	1 service	-	-
238	Inbound	-	2 services	8 services	2 services	6 services
	Outbound	1 service	2 services	9 services	3 services	5 services

The BusConnects project currently being promoted by the National Transport Authority (NTA) aims to deliver a much-enhanced bus service to the Greater Dublin Area (GDA). Some route improvements set out under the BusConnects plan are already in place or being implemented.

The routes proposed to serve the local area are shown in **Figure 17.6** and outlined below.

Figure 17.6 BusConnects Routes Map – extracted from BusConnects Revised Network Map.



- B Spine (Blachardstown to City Centre) & Branch Route B3: Tyrrelstown – City Centre – Dun Laoghaire.
- Local Route L62: Blanchardstown – Tyrellstown Broombridge.
- Local Route L63: Damastown – Blanchardstown.
- Peak-only Route P63: Damastown – Corduff – City Centre (two-way)

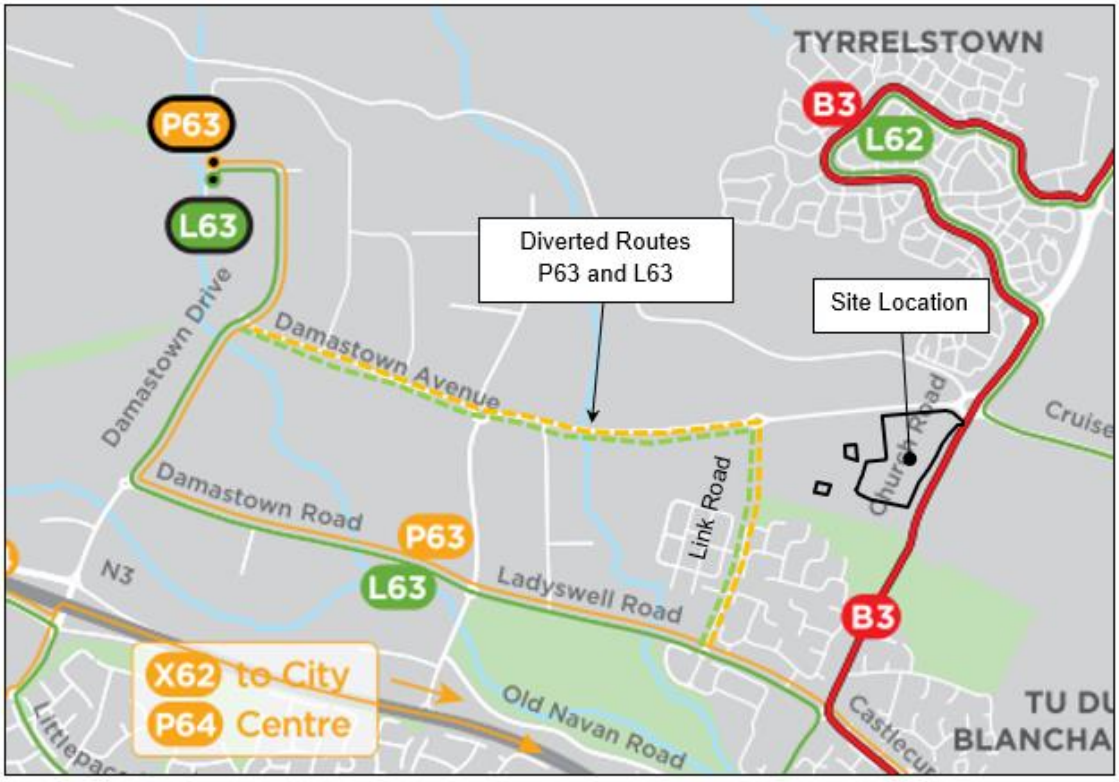
A summary of the Weekday and Weekend frequencies of which these BusConnects routes are proposed to operate is presented in **Table 17.6**.

Table 17.6 Proposed Development Trips – AM & PM Peak Hours

Weekday Frequency					
Route	Before 07:00	07:00 to 09:00	09:00 to 15:00	15:00 to 18:00	After 18:00
B3	15 to 30 min	15 min	15 min	15 min	15 to 30 min
L62	30 min	15 min	30 min	15 min	30 to 60 min
L63	15 to 30 min	15 min	15 min	15 min	15 to 30 min
P63	-	6 services	-	9 services	-
Saturday Frequency					
Route	Before 07:00	07:00 to 09:00	09:00 to 15:00	15:00 to 18:00	After 18:00
B3	20 min	20 min	15 min	15 min	20 to 30 min
L62	60 min	60 min	30 min	30 min	30 to 60 min
L63	20 min	20 min	15 min	15 min	15 to 30 min
P63	-	-	-	-	-
Sunday Frequency					
Route	Before 07:00	07:00 to 09:00	09:00 to 15:00	15:00 to 18:00	After 18:00
B3	-	30 min	20 min	20 min	30 min
L62	-	60 min	30 min	30 min	30 to 60 min
L63	-	30 min	20 min	20 min	30 min
P63	-	-	-	-	-

To improve access from the existing, approved, proposed and future residential developments in the area of Church Fields to the future surrounding bus network, the diversion of the Local Route L63 and the Peak-only Route P63 from their original Ladyswell Road – Damastown Road – Damastown Drive route to Church Fields Link Road – Damastown Avenue route has been discussed and agreed in principle with the National Transport Authority (NTA). Refer to **Figure 17.7**.

Figure 17.7 BusConnects Routes P63 and L63 diversion



17.4 Characteristics of Proposed Development

17.4.1 General

A full description of the proposed development can be found in Chapter 5 of this EIAR. The following is a broad outline of the development.

The proposed development consists of 217 no. residential units (121 no. houses and 96 no. apartments). The breakdown of the proposed residential units is shown in **Table 17.7**.

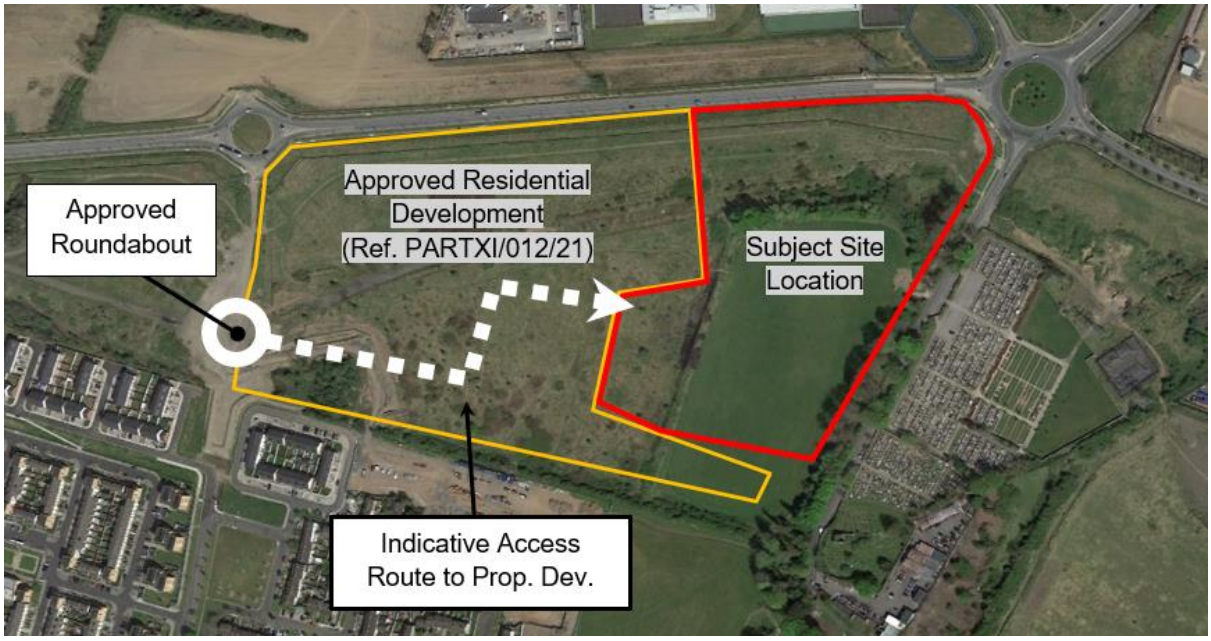
Table 17.7 Breakdown of Proposed Residential Units.

Unit Type	1-Bed	2-Bed	3-Bed	4-Bed	Total
Houses	-	34	76	11	121
Apartments	36	56	4	-	96
Total	36	90	80	11	217

17.4.2 Vehicular Access

Vehicular access to the subject development is proposed via the approved residential development to the west of the site (Ref. PARTXI/012/21) which will be accessed via a permitted cycle friendly roundabout on the Church Fields Link Road (permitted under Planning Reg. Ref. PARTXI/011/19).

Figure 17.8 Indicative Vehicular Access Route via Permitted Development to Proposed Development



17.4.3 Parking Provision

17.4.3.1 Car Parking

To ensure adequate parking provision, the Fingal Development Plan (2023 – 2029) created the following two distinct car parking zones:

- Zone 1: relates to developments within 800m of Bus Connects spine route, or 1,600m of an existing or planned Luas/Dart/Metro Rail station or within an area covered by a Section 49 scheme, or in lands zoned Major Town Centre.

- Zone 2: relates to all other areas within the County.

The proposed development site is located adjacent to the proposed BusConnects Branch Route B3. This route combines with Branch Routes B1, B2 & B4 to form the BusConnects Spine B (from Blanchardstown to City Centre) c. 1.8km southeast of the proposed site, i.e. Branch Route B3 is not recognised as a Spine route itself, but rather one of the four branches that create the Spine c. 1.8km from the subject site. Therefore, the proposed development site is located in Zone 2 as it is not within 800m of a BusConnects spine route.

The requirement for the proposed development, based on Zone 2 standards, is 351 car parking spaces (norm).

The Greater Dublin Area Transport Strategy (2022 – 2042) and the Sustainable Urban Housing: Design Standards for New Apartments (December 2022), recognises that the proposed development meets criteria for a reduced car parking provision.

The car parking spaces proposed to serve the subject development are presented in **Table 17.8**.

Table 17.8 Proposed Car Parking Spaces

Proposed Development	Type of Parking	Proposed Car Parking Spaces
Houses (121 Units)	Residents	165 spaces
	Visitors	24 spaces
Apartments (96 units)	Residents	98 spaces
	Visitors	19 spaces
Total	All types	306 spaces

A total of 306 car parking spaces are proposed, 15 spaces (5%) are disabled spaces and 20% (61 spaces) are equipped with charging points for electric vehicles (EV). All parking spaces will have the ducting infrastructure to allow for future EV charging points should the demand for this facility requires. 12 motorcycle spaces are proposed for the apartments at a rate of 1 motorcycle bay per 10 car parking spaces.

The car parking proposed is below the Zone 2 requirement set out in the Fingal Development Plan (2023 – 2029).

The diversion of the BusConnects routes (P63 & L63) onto the Wellview Avenue / Church Fields Link Road, and the future BusConnects Branch route (B3) along Church Road, would improve the access from the proposed development to the future surrounding bus network and this amendment has been discussed and agreed in principle with the NTA. These are likely to make public bus service a very viable option for residents of the proposed development with potential to support a reduction in the use of private car and ultimately the reduced car parking space provision.

As part of the overall proposal, the use of private car by residents will be discouraged whilst sustainable modes of transport will be encouraged.

The reduced car parking provision is considered appropriate for the subject development and will reflect the location of the proposed development in relation to future public transport services.

The site is therefore considered a transitional area in terms of public transport provision and car parking requirements, and the level of parking proposed balances the need to make appropriate provision for

car parking and encouraging the use of public transport. An overprovision of car parking could discourage the latter by facilitating travel by private car.

17.4.3.2 Bicycle Parking

Bicycle parking spaces requirement for new developments are set out in Table 14.17 of the Fingal Development Plan (2023 – 2029). The bike spaces required for the proposed development is 856 spaces, being 808 long-stay spaces and 48 short-stay spaces.

The bicycle parking proposed to serve the subject development is presented in **Table 17.9**. The proposed provision exceeds the Fingal Development Plan requirement.

Table 17.9 Proposed Bicycle Parking Spaces

Proposed Development	Type of Parking	Proposed Bicycle Parking Spaces
Houses (121 Units)	Residents	549 spaces
	Visitors	-
Apartments (96 units)	Residents	300 spaces
	Visitors	48 spaces
Total	All types	897 spaces

17.5 Predicted Impacts of the Proposed Development

17.5.1 Do-Nothing Impact

Should the proposed development not take place, the subject site will remain in its current state. Background traffic growth is expected to grow over time. Given the location and zoning of the subject site, it is reasonable to assume that a similar development, with a potentially more intensive requirement for vehicular trips would be established on this site at some stage in the future.

17.5.2 Construction Phase

During the construction phase of the proposed development, some construction traffic movements will be undertaken by heavy goods vehicles, though there will also be vehicle movements associated with the appointed contractors and their staff.

An estimate of the day-to-day traffic movements associated with the construction activities, based on experience of similar sites, considered that the number of related heavy goods vehicle movements to and from the application site will be no more than 3 arrivals/departures per hour, with most of the trips undertaken outside the AM and PM peak hours. During the earthworks phase of the development, up to c. 2,388m^3 of material will be removed off site over a four-week period, with one additional HGV movement per hour during this period.

The general workforce is likely to be c. 100 in number per day, reaching 150 persons at peak times. It is estimated that c. 80% of the workforce will travel to/from the site by a vehicle and will carpool on average 2 workers per vehicle. As a result, the site will attract/generate 40-60 number of vehicles per day, with the majority of the trips being undertaken outside the AM and PM peak hours.

Workers will be encouraged to reduce or eliminate the use of private cars by being informed about the public transport options and active mode facilities provided in the area.

The number of construction vehicle movements is low compared to the number of vehicular trips expected to be generated by the proposed development during the operation phase (refer to Section 17.5.3). It should be noted that most of such trips will occur outside of the traditional peak hours, and it is not considered that this level of construction traffic would result in any major operational problems. No road or junction assessment for the construction phase was undertaken.

A construction carpark, within the construction compound, will be created at the start of works by the laying of a temporary surface for vehicles.

It is intended that all HGV deliveries and workforce trips to/from the site will be made from north via left-in left-out temporary access point off Damastown Avenue. Refer to **Figure 17.9** and **17.10** below. A restriction on using any of the surrounding residential roads for construction traffic will be put in place.

Figure 17.9 Indicative Vehicular Access Route via Permitted Development.

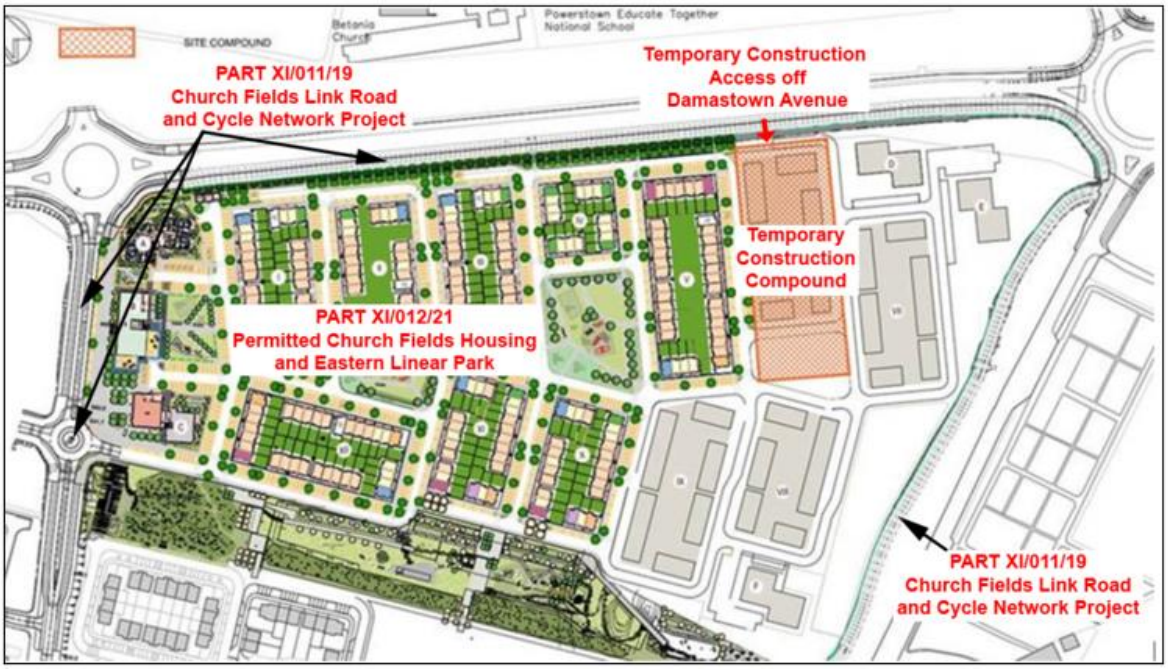
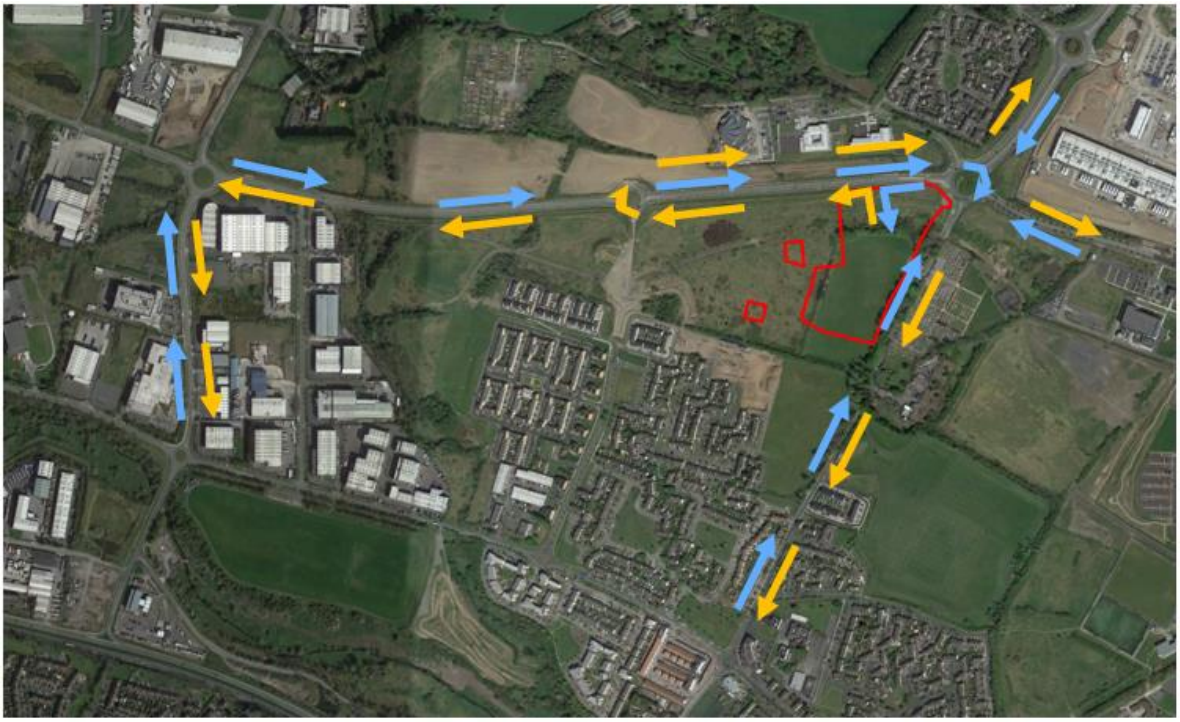


Figure 17.10 Indicative Vehicular Access Route via Permitted Development.



It can be determined that the effect of traffic on the surrounding road network during the construction phase will be **short-term** in nature and **slight negative** in terms of effect.

Care will be taken to ensure that the pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period. It is likely that construction will have a **not significant short-term** effect on pedestrian and cycle infrastructure.

17.5.3 Operational Phase

17.5.3.1 Proposed Development Trip Generation

The peak hour trip generation potential estimated for the proposed development (217 no. residential units – 121 houses and 96 apartments) is shown in **Table 17.10**. The trip rates used to calculate the potential traffic to/from the proposed development were derived from various trip rates used in a number of recent Strategic Housing Development (SHD) applications to An Bord Pleanàla. Please refer to Section 7 of the Traffic and Transport Assessment accompanying the documentation package under a separate cover.

Table 17.10 Proposed Development Trips – AM & PM Peak Hours

	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Trip Rates	0.145	0.398	0.352	0.207
Trip Generation	32	86	77	45

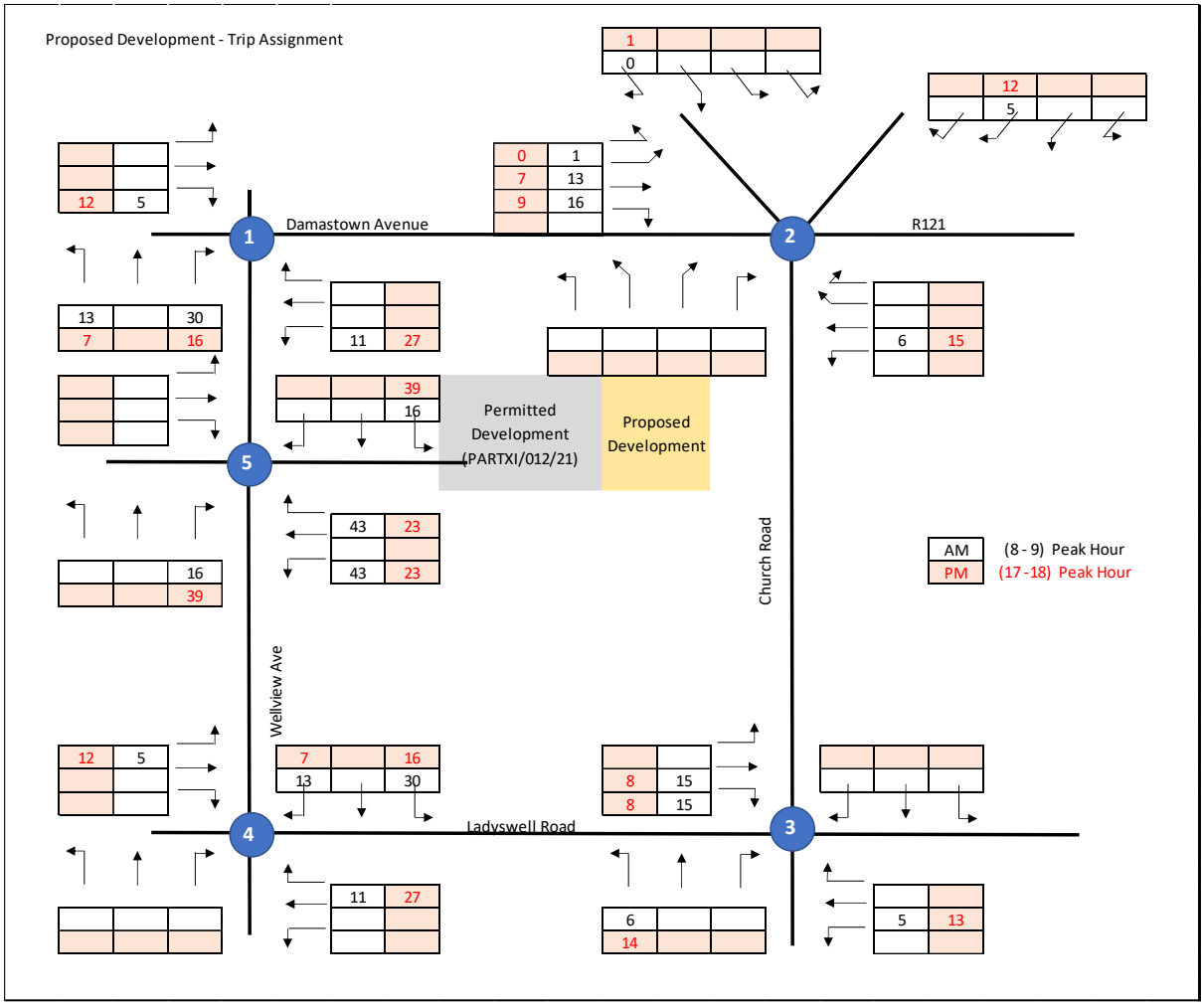
It is estimated that the proposed development will generate a total of 118 two-way vehicular trips in the AM peak hour (32 inbound and 86 outbound) and a total of 122 two-way vehicular trips in the PM peak hour (77 inbound and 45 outbound). These trips will be *momentary* in terms or duration, and *slight negative* in terms of magnitude.

17.5.3.2 Proposed Development Trip Distribution and Assignment

Vehicular access to the subject development is proposed via Junction 5, a roundabout approved as part of the Church Fields Link Road & Cycle Network project. All vehicular trips to and from the site will make their way via Junction 5.

The distribution and assignment for the proposed development trips (arrivals and departures as calculate above) which were generally based on the surveyed traffic movements are shown in **Figure 17.11.** It was assumed that 50% of the generated trips will arrive/depart from north via Junction 1, and 50% will arrive/depart from south via Junction 4.

Figure 17.11 Proposed Development Trips – AM & PM Peak Hours



17.5.3.3 Nearby Permitted & Potential Future Developments

In order to undertake a complete and cumulative assessment of the surrounding road network, the following three nearby permitted developments and the potential future development to the west of Church Fields Link Road were also considered in the analysis.

- Permitted Avondale Park (Planning Reg. Ref. PARTXI/010/19): 70 residential units.
- Permitted Wellview Cul-de-sacs (Planning Reg. Ref. PARTXI/006/18): 20 residential units.
- Permitted Church Fields Housing and Eastern Linear Park Development (Planning Reg. Ref. PARTXI/012/21): 300 residential units + Creche + Retail.
- Potential Future Development to the west of Church Fields Link Road: 500 residential units.

The trip generation for the permitted Wellview Cul-de-sacs development and the potential future development to the west of Church Fields Link Road were calculated based on the trip rates set out in **Table 17.10** above, whilst the trip generation for the permitted Avondale Park and permitted Church Fields Housing and Eastern Linear Park developments were extracted from the traffic studies prepared as part of their planning application.

Table 17.11 Nearby Permitted & Potential Future Development Trips – AM & PM Peak Hours

Development	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Permitted Avondale Park	10	16	27	18
Permitted Wellview Cul-de-sacs	3	8	7	4
Permitted Church Fields Housing and Eastern Linear Park	110	163	166	137
Potential Future Development	72	199	176	104

The above trips will be *momentary* in terms or duration – occurring for less than an hour during the peak periods of the road network, and *moderate negative* in terms of magnitude.

The Potential Future Development to the west of the Church Fields Link Road was included in the Stress Test Scenarios only, whilst the permitted developments were assessed in all scenarios.

17.5.3.4 Potential Traffic Impact on Assessed Junctions

The extent of traffic impact from the proposed and nearby permitted developments has been determined by initially checking where generated traffic would exceed 10% of the traffic flow on the adjoining road or 5% on the road where congestion exists, or the location is sensitive. A summary of the existing two-way traffic and the expected traffic increase at each assessed junction is presented below.

Table 17.12 Existing Two-way Flows and Expected Traffic Increase

Junction	Existing Flow (2023) – AM Peak Hour	Existing Flow (2023) – PM Peak Hour	Additional Traffic Two-way Flow (AM)	Additional Traffic Two-way Flow (PM)	% Traffic Increase (AM)	% Traffic Increase (PM)
Junction 1	1,299	1,205	215	241	16.55%	20.00%
Junction 2	3,309	2,850	150	169	4.53%	5.93%
Junction 3	2,010	1,670	150	169	7.46%	10.23%
Junction 4	793	640	215	241	27.11%	37.66%
Junction 5	0	0	410	453	100.00%	100.00%

With the proposed and nearby permitted developments in place Junctions 1, 3, 4 and 5 are expected to receive a two-way traffic increase higher than 10%. The traffic increase in Junction 2 is estimated at >5%. As Junction 2 is considered sensitive in terms of traffic load, all junctions have been modelled.

The cumulative effect of the proposed and permitted nearby developments will be *momentary not significant* on Junctions 2 and 3 during the peak hours. On Junctions 1, 4 and 5 (Junction 5 under construction), the peak hours cumulative effects will be *momentary slight negative*.

17.5.3.5 Assessed Junctions

The following junctions were modelled as part of this report:

- Junction 1 (Roundabout): Church Fields Link Road / Damastown Avenue
- Junction 2 (Roundabout): Damastown Avenue / Church Road / Damastown Avenue / Powerstown Road / R121 Cruiserath Road.
- Junction 3 (Roundabout): Church Road / Castlecurragh / Ladyswell Road.
- Junction 4 Roundabout): Damastown Road / Parnell Drive / Wellview Avenue.
- Junction 5 (Roundabout): Church Fields Link Road / Access Road to Proposed Development.

17.5.3.6 Assessed Scenarios

The performance of the junctions has been analysed for the critical AM and PM peak hours (08h00 to 09h00 and 17h00 to 18h00) for the following scenarios:

- 2026 DO NOTHING: baseline flows factored up + traffic to/from nearby permitted developments.
- 2031 DO NOTHING: baseline flows factored up + traffic to/from nearby permitted developments.
- 2041 DO NOTHING: baseline flows factored up + traffic to/from nearby permitted developments.
- 2026 DO SOMETHING: 2026 DO NOTHING + traffic to/from proposed development.
- 2031 DO SOMETHING: 2031 DO NOTHING + traffic to/from proposed development.
- 2041 DO SOMETHING: 2041 DO NOTHING + traffic to/from proposed development.
- 2031 STRESS TEST: 2031 DO SOMETHING + traffic to/from potential future development to the west of Church Fields Link Road.
- 2041 STRESS TEST: 2041 DO SOMETHING + traffic to/from potential future development to the west of Church Fields Link Road.

17.5.3.7 Analysis Results

The Traffic and Transport Assessment (TTA) prepared for the subject application (accompanying the documentation package under a separate cover) includes detailed traffic modelling to assess impact and determine if any upgrade works would be required on the surrounding road to facilitate the proposed development. A summary of the ARCADY analysis results for each junction is provided below.

Junction 1

Junction 1 is an existing two-arm roundabout with an ICD of 50 metres and provision for a future third arm (south) and fourth arm (north) – located on Damastown Avenue to the west of the proposed development site, which receive planning permission under *Church Fields Link Road and Cycle Network* project to be upgraded to a three-arm roundabout with the new southern approach forming the approved Church Fields Link Road.

In summary, the approved scheme for Junction 1 as set out in the *Church Fields Link Road and Cycle Network – Part 8 Planning General Arrangement Sheet 5*, consists of:

a) The rearrangement of the existing pedestrian/cycle facilities to provide signalised pedestrian crossings and off-road cycle lanes approaching the junction from west and east; and
b) The provision of longer flared lanes on the western and eastern approaches as a result of the removal of the existing on-road cycle lanes

Junction 1 has been modelled based on its approved layout. The arms of the roundabout were labelled as follows within the model:

- Arm 1: Damastown Avenue (E);
- Arm 2: Church Fields Link Road (S);
- Arm 3: Damastown Avenue (W);
- Arm 4: Future Fourth Arm (N)

Table 17.13 Junction 1 – DO NOTHING – ARCADY Analysis Results

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO NOTHING						
1	0.6	3.65	0.37	1.0	4.68	0.51
2	0.1	4.97	0.12	0.2	5.72	0.14
3	1.2	5.26	0.56	0.6	3.74	0.36
4	0.0	0.00	0.00	0.0	0.00	0.00
2031 DO NOTHING						
1	0.6	3.77	0.39	1.2	4.95	0.54
2	0.1	5.08	0.12	0.2	5.93	0.15
3	1.4	5.65	0.59	0.6	3.86	0.38
4	0.0	0.00	0.00	0.0	0.00	0.00
2041 DO NOTHING						
1	0.7	3.84	0.40	1.2	5.11	0.56
2	0.1	5.14	0.13	0.2	6.06	0.15
3	1.5	5.88	0.61	0.6	3.94	0.40
4	0.0	0.00	0.00	0.0	0.00	0.00

Table 17.14 Junction 1 – DO SOMETHING – ARCADY Analysis Results

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO SOMETHING						
1	0.6	3.70	0.38	1.1	4.87	0.53
2	0.2	5.26	0.17	0.2	5.92	0.17
3	1.3	5.42	0.56	0.6	3.82	0.37
4	0.0	0.00	0.00	0.0	0.00	0.00
2031 DO SOMETHING						
1	0.7	3.83	0.40	1.2	5.17	0.56
2	0.2	5.38	0.18	0.2	6.14	0.18
3	1.5	5.82	0.60	0.6	3.95	0.39
4	0.0	0.00	0.00	0.0	0.00	0.00
2041 DO SOMETHING						
1	0.7	3.89	0.41	1.3	5.34	0.57
2	0.2	5.45	0.18	0.2	6.28	0.18
3	1.6	6.06	0.61	0.7	4.03	0.41
4	0.0	0.00	0.00	0.0	0.00	0.00

Table 17.15 Junction 1 – STRESS TEST – ARCADY Analysis Results

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2031 STRESS TEST						
1	0.7	3.95	0.42	1.5	5.72	0.60
2	0.4	6.25	0.30	0.3	6.70	0.25
3	1.6	6.28	0.62	0.7	4.15	0.42
4	0.0	0.00	0.00	0.0	0.00	0.00
2041 STRESS TEST						
1	0.7	4.02	0.43	1.6	5.93	0.62
2	0.4	6.34	0.30	0.3	6.86	0.26
3	1.7	6.56	0.64	0.7	4.23	0.43
4	0.0	0.00	0.00	0.0	0.00	0.00

The analysis results as summarised above indicate that, Junction 1, with its approved/upgraded layout, would operate within capacity for the future 2041 DO SOMETHING scenario during both peak hours and would continue to do so for the 2041 STRESS TEST scenario, with the highest RFC at 0.64 in the AM and 0.62 in the PM.

Junction 2

Junction 2 is an existing five-armed roundabout with an ICD of 75 metres located immediately northeast of the proposed development site. As part of the *Church Fields Link Road and Cycle Network* project some improvement works are also approved for this junction. In summary, these improvements include:

a) The construction of a new signalised pedestrian crossing on R121 (NE), Powerstown Road (NW) and Church Road (S) approaches;
b) The upgrade of the existing 2m Pelican Crossing on Damastown Avenue (Western Approach) to a 4m Toucan Crossing;
c) The rearrangement of the existing pedestrian/cycle facilities to provide off-road cycle lanes approaching the junction; and
d) The provision of longer flared lanes on the western approach (Damastown Avenue) as a result of the removal of the existing on-road cycle lane.

Junction 2 has been modelled based on its approved configuration. The arms of the roundabout were labelled as follows within the model:

- Arm 1: Powerstown Road (NW);
- Arm 2: R121 (NE);
- Arm 3: R121 (E);
- Arm 4: Church Road (S);
- Arm 5: Damastown Avenue (W).

Table 17.16 Junction 2 – DO NOTHING – ARCADY Analysis Results

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO NOTHING						
1	1.1	13.98	0.54	0.1	5.19	0.06
2	2.7	8.77	0.74	1.0	3.81	0.49
3	0.9	6.75	0.47	18.9	62.89	1.01
4	2.7	12.77	0.74	1.0	8.17	0.50
5	9.1	37.44	0.94	1.4	8.34	0.58
2031 DO NOTHING						
1	1.5	16.94	0.61	0.1	5.38	0.07
2	2.7	8.70	0.74	1.1	4.06	0.52
3	0.9	6.88	0.49	46.8	142.36	1.10
4	3.1	14.13	0.77	1.1	8.78	0.53
5	19.3	78.48	1.03	1.6	9.14	0.62
2041 DO NOTHING						
1	1.7	18.68	0.64	0.1	5.47	0.07
2	4.0	11.90	0.81	1.2	4.22	0.54
3	1.1	7.83	0.53	69.6	202.78	1.15
4	4.5	20.11	0.84	1.2	9.11	0.55
5	31.7	122.69	1.08	1.7	9.57	0.64

Table 17.17 Junction 2 – DO SOMETHING – ARCADY Analysis Results

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO SOMETHING						
1	1.2	14.40	0.55	0.1	5.24	0.07
2	2.8	8.95	0.75	1.0	3.87	0.50
3	0.9	6.85	0.47	23.1	76.77	1.03
4	2.7	13.00	0.74	1.0	8.31	0.50
5	11.9	46.16	0.97	1.4	8.57	0.59
2031 DO SOMETHING						
1	1.5	17.23	0.61	0.1	5.43	0.07
2	3.5	10.59	0.79	1.1	4.14	0.53
3	1.0	7.54	0.51	55.2	164.62	1.12
4	3.8	17.19	0.81	1.1	8.89	0.53
5	26.9	105.34	1.06	1.6	9.37	0.63
2041 DO SOMETHING						
1	1.7	18.91	0.64	0.1	5.99	0.08
2	4.1	12.11	0.82	1.3	4.81	0.57
3	1.1	7.95	0.53	78.8	227.82	1.17
4	4.6	20.60	0.84	1.3	9.74	0.56
5	42.6	157.11	1.11	1.8	10.21	0.66

The analysis results as summarised above, indicate that, even without the proposed development trips included, for the 2026 DO NOTHING scenario (with the approved nearby developments in place),

Junction 2 with its approved layout, would operate above capacity (at 1.01 RFC) in the PM peak hour and at capacity (at 0.94 RFC) in the AM peak hour.

For the 2026 DO SOMETHING scenario with the proposed development trips in place, Junction 2 would continue to operate with a similar level of capacity when compared to the 2026 DO NOTHING. In the AM peak hour, the highest RFC increases from 0.94 to 0.97 and the corresponding queue increases by only 3 cars. In the PM peak hour, the highest RFC increases from 1.01 to 1.03 and the corresponding queue increases by only 4 cars. It is important to take into consideration that these recorded RFC and queue lengths refer to the morning and evening peak hours and these conditions will only occur for a short period of time.

For the 2031 and 2041 scenarios (DO NOTHING and DO SOMETHING), it can be noted that the proposed development trips will continue to have a negligible impact on Junction 2. The level of RFC increase will not be higher than 3% (0.03) in both peak hours. In the worst case (2041 DO SOMETHING), the proposed development will add only c. 10 cars to the longest queues in the AM and PM peak hours.

For the STRESS TEST scenarios (**Table 17.18**), however, with the inclusion of the traffic generated by the potential future development to the west of Church Fields Link Road, the results indicate that the cumulative impact on Junction 2 would be of a scale that would require additional improvement works to the junction, such of its signalisation and/or lane width increase. It is anticipated however, that new traffic survey and analysis will be carried out as part of the potential future development planning, and as a reflex of the various approved and planned interventions to the area, further upgrades to Junction 2 might no longer be required.

Table 17.18 Junction 2 – STRESS TEST – ARCADY Analysis Results

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2031 STRESS TEST						
1	1.5	17.69	0.62	0.1	6.00	0.08
2	3.7	10.97	0.80	1.3	4.83	0.57
3	1.1	7.81	0.53	76.6	222.18	1.16
4	4.0	18.10	0.82	1.2	9.68	0.55
5	53.6	188.56	1.14	1.9	10.34	0.66
2041 STRESS TEST						
1	1.7	19.23	0.65	0.1	6.11	0.09
2	4.3	12.51	0.82	1.4	5.01	0.59
3	1.2	8.24	0.55	102.2	305.97	1.21
4	4.9	21.85	0.85	1.3	9.97	0.57
5	74.1	254.66	1.19	2.0	10.76	0.68

Junction 3

Junction 3 is an existing four-arm roundabout with an ICD of 36 metres located to the south of the proposed development site. This junction has been modelled based on its existing layout. The arms of the roundabout were labelled as follows within the model:

- Arm 1: Castlecurragh (E);
- Arm 2: Church Road (S);
- Arm 3: Ladyswell Road (W);

- Arm 4: Church Road (N).

Table 17.19 Junction 3 – DO NOTHING – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO NOTHING						
1	0.9	9.18	0.47	0.5	8.06	0.33
2	2.7	13.97	0.74	1.1	7.42	0.53
3	1.5	10.45	0.61	0.7	6.59	0.42
4	1.6	9.40	0.63	2.2	11.38	0.70
2031 DO NOTHING						
1	1.0	9.95	0.51	0.6	8.62	0.36
2	3.5	17.48	0.80	1.3	8.06	0.56
3	1.7	11.55	0.64	0.8	6.96	0.45
4	1.9	10.24	0.66	2.8	13.60	0.75
2041 DO NOTHING						
1	1.1	10.43	0.53	0.6	8.99	0.38
2	4.2	20.07	0.83	1.4	8.47	0.58
3	1.9	12.19	0.66	0.8	7.19	0.46
4	2.1	10.74	0.68	3.3	15.43	0.78

Table 17.20 Junction 3 – DO SOMETHING – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO SOMETHING						
1	0.9	9.43	0.48	0.5	8.32	0.35
2	2.8	14.42	0.75	1.2	7.76	0.55
3	1.6	11.00	0.63	0.8	6.74	0.43
4	1.7	9.68	0.64	2.3	11.56	0.70
2031 DO SOMETHING						
1	1.0	10.21	0.52	0.6	8.91	0.38
2	3.7	18.20	0.80	1.4	8.46	0.58
3	1.9	12.19	0.67	0.8	7.13	0.46
4	2.0	10.57	0.67	2.9	14.07	0.76
2041 DO SOMETHING						
1	1.1	10.73	0.54	0.6	9.29	0.40
2	4.4	20.99	0.83	1.5	8.92	0.60
3	2.1	13.36	0.69	0.9	7.36	0.48
4	2.1	11.09	0.69	3.4	16.00	0.79

The analysis results as summarised above indicate that, for the wors-case scenario (2041 DO SOMETHING), the existing Junction 3 would operate within capacity during both peak hours, with the highest RFC at 0.83 recorded on Church Road (S) in the AM peak hour.

Table 17.21 Junction 3 – STRESS TEST – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2031 STRESS TEST						
1	1.1	10.88	0.54	0.7	9.62	0.43
2	4.1	20.01	0.82	1.6	9.55	0.62
3	2.7	15.53	0.74	1.0	7.54	0.50
4	2.1	11.37	0.69	3.2	15.26	0.78
2041 STRESS TEST						
1	1.2	11.44	0.56	0.8	10.05	0.44
2	4.9	23.32	0.85	1.7	10.11	0.64
3	3.1	17.53	0.77	1.0	7.80	0.51
4	2.3	12.09	0.71	3.8	17.61	0.81

The results above indicate that Junction 3 would continue to operate within capacity for the STRESS TEST scenarios, with the inclusion of the traffic generated by the potential future development to the west of the Church Fields Link Road, with the highest RFC at 0.85 in the AM peak hour and 0.81 in the PM peak hour.

Junction 4

Junction 4 is an existing four-arm roundabout with an ICD of 36 metres located to the south of the proposed development site. As part of the *Church Fields Link Road and Cycle Network* project some improvement works are also approved for this junction. In summary, these improvements include:

a) The maintenance of the existing 36 metres ICD;

b) The construction of new signalised pedestrian crossings on Ladyswell Road (E), Wellview Avenue (N) and Damastown Road (W) approaches;

c) The construction of a new ramped zebra-controlled crossing on Parnell Drive (S) approach; and

d) The provision of off-road cycle lanes approaching the junction.

Junction 4 has been modelled based on its approved layout. The arms of the roundabout were labelled as follows within the model:

- Arm 1: Ladyswell Road (E);
- Arm 2: Parnell Drive (S);
- Arm 3: Damastown Road (W);
- Arm 4: Wellview Avenue (N).

Table 17.22 Junction 4 – DO NOTHING – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO NOTHING						
1	0.7	7.71	0.41	0.6	7.40	0.37
2	0.1	3.80	0.08	0.0	3.57	0.05
3	0.8	9.19	0.44	0.8	9.42	0.45
4	0.5	6.07	0.32	0.3	5.37	0.24
2031 DO NOTHING						
1	0.7	8.00	0.43	0.6	7.63	0.39
2	0.1	3.86	0.09	0.1	3.61	0.05
3	0.9	9.63	0.47	0.9	9.87	0.48
4	0.5	6.28	0.34	0.3	5.50	0.26
2041 DO NOTHING						
1	0.8	8.16	0.44	0.6	7.76	0.40
2	0.1	3.89	0.09	0.1	3.63	0.05
3	0.9	9.89	0.48	0.9	10.13	0.49
4	0.5	6.40	0.35	0.3	5.57	0.26

Table 17.23 Junction 4 – DO SOMETHING – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO SOMETHING						
1	0.7	7.97	0.43	0.7	7.83	0.40
2	0.1	3.85	0.08	0.0	3.63	0.05
3	0.8	9.37	0.45	0.9	9.91	0.47
4	0.6	6.50	0.37	0.4	5.55	0.27
2031 DO SOMETHING						
1	0.8	8.27	0.45	0.7	8.07	0.42
2	0.1	3.91	0.09	0.1	3.67	0.05
3	0.9	9.84	0.48	1.0	10.41	0.50
4	0.6	6.73	0.39	0.4	5.68	0.28
2041 DO SOMETHING						
1	0.8	8.43	0.46	0.7	8.22	0.43
2	0.1	3.95	0.09	0.1	3.69	0.05
3	0.9	10.10	0.49	1.0	10.69	0.51
4	0.6	6.87	0.40	0.4	5.76	0.29

The analysis results as summarised above indicate that, for the worst-case scenario (2041 DO SOMETHING), the approved Junction 4 would operate within capacity during both peak hours, with the highest RFC at 0.49 in the AM and 0.51 in the PM, both occurring on Damastown Road (W).

Table 17.24 Junction 4 – STRESS TEST – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2031 STRESS TEST						
1	0.9	8.92	0.48	1.0	9.27	0.50
2	0.1	4.03	0.09	0.1	3.82	0.05
3	1.0	10.33	0.50	1.2	11.79	0.55
4	1.0	8.04	0.50	0.5	6.14	0.34
2041 STRESS TEST						
1	1.0	9.12	0.50	1.0	9.44	0.51
2	0.1	4.07	0.10	0.1	3.84	0.05
3	1.0	10.63	0.51	1.2	12.13	0.56
4	1.0	8.21	0.50	0..5	6.23	0.35

For the STRESS TEST (with the inclusion of the traffic generated by the potential future development to the west of the Church Fields Link Road), the results indicate that Junction 4 would continue to operate within capacity during both peak hours, with the highest RFC at 0.51 in the AM and 0.56 in the PM.

Junction 5

Junction 5 is a recently approved cycle friendly roundabout to be located on the new Church Fields Link Road approximately 165 metres south of the existing roundabout with Damastown Avenue. This junction, which the eastern approach will provide the vehicular access to the approved adjacent residential development and the proposed development, will comprise an ICD of 24 metres as approved under the planning permission for the *Church Fields Link Road and Cycle Network* project.

Modelling for Junction 5 has been undertaken based on its approved layout as set out in *Church Fields Link Road and Cycle Network – Part 8 Planning General Arrangement Sheet 4.* The arms of the roundabout were labelled as follows within the model:

- Arm 1: Proposed Site Access Road (E);
- Arm 2: Church Fields Link Road (S);
- Arm 3: Future Access Road to Church Fields Western Development (W);
- Arm 4: Church Fields Link Road (N).

From the analysis results as summarised below, the approved Junction 5 would operate within capacity for the wors-case scenario (2041 DO SOMETHING) during both AM and PM peak hours with the highest RFC at 0.35 occurring on the Proposed Site Access Road (E) in the AM, and with the highest RFC at 0.26 also occurring on the Proposed Site Access Road (E) in the PM. No significant vehicular queuing or delay was recorded.

Table 17.25 Junction 5 – DO NOTHING – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO NOTHING						
1	0.3	6.42	0.23	0.2	6.18	0.19
2	0.1	6.08	0.10	0.2	6.32	0.14
3	0.0	0.00	0.00	0.0	0.00	0.00
4	0.1	6.05	0.10	0.2	6.61	0.16
2031 DO NOTHING						
1	0.3	6.42	0.23	0.2	6.18	0.19
2	0.1	6.08	0.10	0.2	6.32	0.14
3	0.0	0.00	0.00	0.0	0.00	0.00
4	0.1	6.05	0.10	0.2	6.61	0.16
2041 DO NOTHING						
1	0.3	6.42	0.23	0.2	6.18	0.19
2	0.1	6.08	0.10	0.2	6.32	0.14
3	0.0	0.00	0.00	0.0	0.00	0.00
4	0.1	6.05	0.10	0.2	6.61	0.16

Table 17.26 Junction 45– DO SOMETHING – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2026 DO SOMETHING						
1	0.5	7.64	0.35	0.3	6.70	0.26
2	0.1	6.44	0.13	0.3	6.90	0.21
3	0.0	0.00	0.00	0.0	0.00	0.00
4	0.1	6.29	0.12	0.3	7.39	0.22
2031 DO SOMETHING						
1	0.5	7.64	0.35	0.3	6.70	0.26
2	0.1	6.44	0.13	0.3	6.90	0.21
3	0.0	0.00	0.00	0.0	0.00	0.00
4	0.1	6.29	0.12	0.3	7.39	0.22
2041 DO SOMETHING						
1	0.5	7.64	0.35	0.3	6.70	0.26
2	0.1	6.44	0.13	0.3	6.90	0.21
3	0.0	0.00	0.00	0.0	0.00	0.00
4	0.1	6.29	0.12	0.3	7.39	0.22

The results indicate that the approved Junction 5 would continue to operate within capacity for the STRESS TEST scenarios, with the inclusion of the traffic generated by the potential future development to the west of the Church Fields Link Road, with the highest RFC at 0.38 in the Am and 0.38 in the PM.

Table 17.27 Junction 5 – STRESS TEST – ARCADY Analysis Results.

Arm	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2031 STRESS TEST						
1	0.6	8.81	0.38	0.4	7.53	0.28
2	0.2	7.08	0.19	0.6	9.08	0.36
3	0.5	8.51	0.32	0.2	6.92	0.17
4	0.2	7.24	0.19	0.6	9.50	0.38
2041 STRESS TEST						
1	0.6	8.81	0.38	0.4	7.53	0.28
2	0.2	7.08	0.19	0.6	9.08	0.36
3	0.5	8.51	0.32	0.2	6.92	0.17
4	0.2	7.24	0.19	0.6	9.50	0.38

From the analysis results as summarised above, it can be determined that the effects of the proposed development during the operational phase with regards to peak hour traffic will be **momentary** in terms or duration, and **slight negative** in terms of magnitude. Outside the peak hours, however, the effects are likely to be **permanent** in terms of duration, but **imperceptible** or **not significant** in terms of magnitude.

17.6 Mitigation Measures

This section of the report discusses mitigation measures to reduce the impact of the proposed development on the surrounding area during the construction and operational phases.

17.6.1 Construction Phase

A 'Construction Environmental Management Plan (PCEMP)' has been prepared by Brady Shipman Martin for the subject development in order to provide guidance on how to minimise the potential impact of the construction stage of the proposed development on the safety and amenity of other users of the public road. The CEMP, which accompanies the documentation package under a separate cover, considers the following aspects:

- Dust and dirt control measures;
- Noise assessment and control measures;
- Routes to be used by vehicles;
- Working hours of the site;
- Details of construction traffic forecasts;
- Times when vehicle movements and deliveries will be made to the site;
- Facilities for loading and unloading;
- Facilities for parking cars and other vehicles.

The specific measures will include, but will not be limited to the following:

- Issue of instructions and maps on getting to site to each supplied sub-contractor to avoid 'lost' construction traffic travelling on unapproved routes;
- Ongoing assessment of the most appropriate routes for construction traffic to and from the site;
- Interface with the operation of local traffic;
- Use of a banksman and/or traffic lights to control the exit of construction vehicles;

- Not allowing construction traffic to wait on public roads;
- Schedule the delivery of materials daily;
- Provision of vehicle and wheel washing facilities on site.

These are further outlined in the CEMP.

Further to the above, a detailed Construction Management Plan (CMP) and a Construction Traffic Management Plan (CTMP) will also be prepared by the main contractor prior to the construction stage. These documents, which will be prepared in coordination and agreement with the Local Authority, will outline site logistics and indicate the following:

- Site access location;
- Site boundary lines;
- Tower crane locations;
- Vehicle entry and exit routes to/from the site;
- Diversion of pedestrian and cycling routes;
- Location of loading and unloading areas;
- Location of site offices and welfare facilities;
- Location of material storage areas;
- Banksmen locations.

Through the implementation of the above detailed Plans prior to the construction stage, it is anticipated that the effect of traffic on the surrounding road network during the construction stage will be **short-term** in nature and **slight negative** in terms of magnitude.

17.6.2 Operational Phase

The analysis of the road network surrounding the subject site has shown that the existing/approved junctions would operate within capacity for the DO SOMETHING scenarios during both AM and PM peak hours with the inclusion of the traffic to/from the permitted and proposed developments, except Junction 2. The analysis for Junction 2 indicates that the effects of the proposed development during the operational phase with regards to peak hour traffic will be **momentary** in terms or duration and **slight negative** in terms of magnitude. Outside the peak hours, however, the effects are likely to be **imperceptible or not significant** in terms of magnitude.

In order to encourage residents of the proposed development to reduce the dependence on private car and avail of sustainable forms of transport such as walking, cycling and public transport, a Travel Plan has been prepared for the subject development and accompanies the documentation package under a separate cover.

The Travel Plan sets out a number of specific actions to be implemented with the objective of promoting sustainability, enhancing public transport and reducing the use of private car, such as:

- Advising residents about approved/upgraded pedestrian and cycling network facilities such as dedicated pedestrian crossings, wide footpaths, off-road cycle lanes and greenways and dedicated cycle lanes linking to the various services and amenities in the expanded area;
- Regularly informing residents about the bike to work scheme which may be available from their employers;
- Providing information to residents about tax incentives for public transport users;
- Publicising student LEAP travel cards and associated benefits;

- Advising residents regarding local bus routes and the nearest bus stops, and the travel time to/from Dublin City Centre, Blanchardstown and other key destinations;
- Providing secure cycle parking within the proposed development;
- Providing information regarding car sharing benefits.

The upgrade works for pedestrian and cycle facilities approved under the *Church Fields Link Road and Cycle Network* project will improve the pedestrian and cyclist network in the surrounding area. The diversion of the BusConnects routes, would also improve access from the proposed development with the future local bus network.

17.7 Residual Impacts

The residual impacts of the proposed development from a traffic and transport perspective at both construction and operational phases are outlined below.

17.7.1 Construction Phase

Provided the mitigation measures and management procedures outlined in the Construction Management Plan (CMP) and the Construction Traffic Management Plan (CTMP) are incorporated during the construction phase, the residual impact upon the local receiving environment is predicted to be *short-term* in nature and *slight negative* in terms of effect.

17.7.2 Operational Phase

The analysis of the road network surrounding the subject site has shown that the existing/approved junctions would operate within capacity for the DO SOMETHING scenarios during both AM and PM peak hours with the inclusion of the traffic to/from the permitted and proposed developments, except Junction 2. The analysis for Junction 2 indicates that the effects of the proposed development during the operational phase with regards to peak hour traffic will be *momentary* in terms or duration, and *slight negative* in terms of magnitude . Outside the peak hours, however, the effects are likely to be *imperceptible or not significant* in terms of magnitude.

The provision of the upgrade works for pedestrian and cycle facilities approved under the *Church Fields Link Road and Cycle Network* project will improve the pedestrian and cyclist network in the surrounding area. The diversion of the BusConnects routes, would also improve access from the proposed development with the future local bus network.

17.8 Monitoring

17.8.1 Construction Phase

During the construction phase the following monitoring is advised:

- Construction vehicle routes and parking;
- Internal and external road conditions;
- Construction activities hours of work.

The specific compliance exercises to be undertaken in relation to the range of measures detailed in the final Construction Management Plan (CMP) and Construction Traffic Management Plan (CTMP) will be agreed with the Planning Authority.

17.8.2 Operational Phase

During the operational phase, the following monitoring is advised in order to further reduce the traffic effects predicted from the proposed development:

- Car parking capacity and associated occupancy.
- Cycle parking capacity and associated occupancy.
- Public transport serving the area, including location of closest bus stops, service frequency and routes, and commuting times from key destinations.

The Travel Plan for the proposed development should be monitored and updated at regular intervals. This will enable tracking in terms of reduction in the dependence on private car journeys and a shift towards sustainable transport options such as walking, cycling and the use of public transport.

17.9 Interactions

There may be temporary negative effects to human health during the construction phase caused by vehicular noise, vibration, dust and air quality which are covered in other chapters of this EIAR (Chapters 11, 12 and 13). There may also be interactions with the surrounding water bodies through surface water runoff topsoil stripping and earthworks which will be required to construct the roads (covered in Chapter 10) and interactions with material assets - waste through surplus excavated material being transported off-site (covered in Chapter 18). There is also potential for interaction with Air Quality and Climate (Chapters 11 &12) as vehicular emissions contain air pollutants, including greenhouse gases with climate impacts, and gases/particulates. Vehicular traffic during the construction phase might also result in increased noise (Ch 13 Noise & Vibration).

The effects of these will be mitigated through the implementation of measures outlined in this chapter and within the Construction Management Plan (CMP) and the Construction Traffic Management Plan (CTMP).

17.10 Cumulative Impacts

Chapter 21 of this reports deals with cumulative impacts of developing the subject site combining with other projects in the surrounding area.

The traffic impact analysis carried out as part of the accompanying Traffic and Transport Assessment, and summarised in this Chapter, already accounts for the cumulative traffic impact from the permitted nearby residential developments and the potential future development to the west of the Church Fields Link Road.

Some permitted developments listed in Chapter 21, outside the immediate area of influence of the proposed development site, may also generate additional traffic on the assessed junctions. This potential additional traffic, however, has already been taken into account by applying traffic growth rates to the baseline traffic.

From the Stress Test Analysis as summarised in this Chapter, it can be determined that the effects of the cumulative development during the operational phase with regards to peak hour traffic will be *momentary* in terms or duration. In terms of magnitude, the traffic effects on all junctions (except Junction 2) will be *slight negative*. The cumulative traffic effects on Junction 2, however, are likely to be *momentary moderate negative*. Outside the peak hours, the cumulative traffic effects are likely to be *permanent* in terms of duration, but *imperceptible or not significant* in terms of magnitude.

17.11 Difficulties Encountered

There were no difficulties encountered compiling this chapter.

17.12 References

- Traffic and Transport Assessment Guidelines, TII / NRA, May 2014
- Fingal Development Plan 2023 – 2029
- GDA Cycle Network Plan, NTA, 2022
- Sustainable Urban Housing: Design Standards for New Apartments (December 2022)
- Church Fields Land Management Plan, FCC, 2019
- Design Manual for Urbans Roads and Streets (2019) - DMURS
- Transport Impact Assessment, Church Fields Land Development, RPS, October 2019
- Traffic Assessment, Avondale Park, Martin Rogers Consulting Ltd., November 2019

18 Material Assets – Waste

18.1 Introduction

This chapter evaluates the impacts, if any, which the proposed development may have on Material Assets -Waste as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU), the EPA EIA Report Guidelines 2022 during the construction and operational phases of the proposed development, as described in Chapter 5 (Description of the Proposed Development).

This Chapter was prepared by Chonaill Bradley (Bsc ENV AssocCIWM) of AWN Consulting Ltd (AWN). Chonaill Bradley is a Principal Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia. He is an Associate Member of the Institute of Waste Management (CIWM). Chonaill has over eight years' experience in the environmental consultancy sector and specialises in waste management. Refer to **Table 1.4** in Chapter 1 (Introduction) for qualifications of authors and reviewers.

A site-specific Resource & Waste Management Plan (RWMP) has been prepared by AWN to deal with waste generation during the excavation and construction phases of the proposed development and has been included as **Appendix 18.1** in Volume 3 of the EIAR. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021).

A separate Operational Waste Management Plan (OWMP) has also been prepared by AWN for the operational phase of the proposed development and is included as **Appendix 18.2** in Volume 3 of the EIAR.

The Chapter has been prepared in accordance with European Commission's guidelines, *Guidance on the preparation of the Environmental Impact Assessment Report* (2017), the EPA *Guidelines on the Information to be contained in EIAR* (2022) and the EU Commission *Notice on changes and extensions to projects* (2021).

These documents will ensure the management of wastes arising at the proposed development site in accordance with legislative requirements and best practice standards.

18.1.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) as amended which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (**Figure 18.1**).

Figure 18.1 Waste Hierarchy (Source: European Commission)

EU and Irish National waste policy also aims to contribute to the circular economy (CE) by extracting high-quality resources from waste as much as possible. CE is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products (**Figure 18.2**).

Figure 18.2 Circular Economy (Source: Repak)

The Irish government issues policy documents that outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, *A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy* (WAPCE), was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to

the Irish and international waste context changing in the years since the launch of the previous waste management plan, *A Resource Opportunity*, in 2012.

One of the first actions to be taken from the WAPCE was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The Circular Economy and Miscellaneous Provisions Act 2022 was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021). The guidance documents, *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* and *Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers* (FÁS & Construction Industry Federation, 2002), were also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the *Eastern Midlands Regional* (EMR) *Waste Management Plan 2015 – 2021*, *BS 5906:2005 Waste Management in Buildings – Code of Practice*, the Fingal County Council (FCC) *Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws, 2020*, the EPA *National Waste Database Reports* 1998 – 2020 and the EPA *National Waste Statistics* Web Resource.

18.1.2 Terminology

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

- **Waste:** Any substance or object which the holder discards or intends or is required to discard.
- **Prevention:** Measures taken before a substance, material or product has become waste, that reduce:
  - the quantity of waste, including through the re-use of products or the extension of the life span of products;
  - the adverse impacts of the generated waste on the environment and human health; or
  - the content of harmful substances in materials and products.
- **Reuse:** Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.
- **Preparing for Reuse:** Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.
- **Treatment:** Recovery or disposal operations, including preparation prior to recovery or disposal.

- **Recovery:** Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.
- **Recycling:** Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.
- **Disposal:** Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations.

18.2 Method

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This chapter is based on the proposed development, as described in Chapter 5 (Description of the Proposed Development) and considers the following aspects:

- Legislative context;
- Construction phase (including site preparation and excavation); and
- Operational phase.

A desktop study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated and are included in Section 18.3.1 of this chapter. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 9 of this EIAR (Land, Soils, Geology and Hydrogeology).

18.3 Baseline Environment

In terms of waste management, the receiving environment is in the jurisdiction of FCC as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *EMR Waste Management Plan 2015 – 2021* and the WAPCE. Currently the EMR and other regional waste management plans are under review and the Regional Waste Management Planning Offices expect to publish the final plan in 2023.

The EMR Waste Management Plan sets out the following targets for waste management in the region:

- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The EMR Waste Management Plan sets out the strategic targets for waste management in the region and sets a specific target for construction and demolition (C&D) waste of *"70% preparing for reuse, recycling and other recovery of construction and demolition waste"* (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. Ireland achieved 78% material recovery of such waste in 2020, and therefore is currently surpassing the 2025 target (Target 70%). The National Waste Statistics update published by the EPA in November 2022 identifies that Ireland's current target of *"Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)"* was met for 2020 at 54%; however, they are currently not in line with the 2025 target (55%).

The FCC *Fingal Development Plan 2023-2029* also set out policies and objectives for the FCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, FCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the EMR, in the surrounding counties and over Ireland and Northern Ireland, for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability.

18.3.1 Characteristics of the Proposed Development

A full description of the proposed development can be found in Chapter 5 (Description of the Proposed Development). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

18.3.1.1 Demolition Phase

There is no demolition associated with the proposed development.

18.3.1.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be contractually required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be topsoil and subsoil excavated to facilitate construction of new foundations and the installation of underground services. The project engineers, Waterman Moylan Consulting Engineers, have estimated that c. 9,550 m^3 of material (topsoil and subsoil) will need to be excavated to do so. It is currently envisaged that c.7,640 m^3 material will be able to be retained and reused on site. It is currently envisaged that c. 1,910 m^3 material will need to be removed off-site. This material will be taken for appropriate off-site reuse, recovery, recycling and / or disposal.

If any material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Regulation 27 (By-products), as amended, of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2011-2020, (previously Article 27 of the European Communities (Waste Directive)). For more information in relation to the envisaged management of by-products, refer to the RWMP (**Appendix 18.1**).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018).

Waste will also be generated from construction phase workers, e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP (**Appendix 18.1**). The RWMP provides an estimate of the main waste types likely to be generated during the construction phase of the proposed development. These are summarised in **Table 18.1**.

Table 18.1 Predicted on and off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	415.6	10	41.6	80	332.5	10	41.6
Timber	352.6	40	141.1	55	194.0	5	17.6
Plasterboard	125.9	30	37.8	60	75.6	10	12.6

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Metals	100.8	5	5.0	90	90.7	5	5.0
Concrete	75.6	30	22.7	65	49.1	5	3.8
Other	188.9	20	37.8	60	113.4	20	37.8
Total	**1259.4**		**285.9**		**855.2**		**118.4**

18.3.1.3 Operational Phase

As noted in **Section 18.1**, an OWMP has been prepared for the proposed development and is included as **Appendix 18.2**. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables (DMR), organic waste and mixed non-recyclable waste (MNR), as well as providing a strategy for management of waste glass, batteries, WEEE, printer / toner cartridges, chemicals, textiles, waste cooking oil and furniture.

The total estimated waste generation for the proposed development for the main waste types, based on the AWN waste generation model (WGM), is presented in **Table 18.2**, below, and is based on the uses and areas as advised by the project architects. Further unit breakdowns can be found in **Appendix 18.2**.

Table 18.2 Estimated waste generation during the operational phase

Waste Type	Waste Volume (m^3/week)				
	Apartment Block D & F (Per Block)	Apartment Block E	2 Bedroom House (Individual)	3 Bedroom House (Individual)	4 Bedroom House (Individual)
Organic Waste	0.48	0.49	0.02	0.02	0.02
DMR	3.38	3.45	0.12	0.14	0.18
Glass	0.09	0.09	> 0.00	> 0.00	> 0.00
MNR	1.78	1.81	0.06	0.07	0.09
Total	**5.73**	**5.84**	**0.20**	**0.23**	**0.29**

The residents tenants will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. As required, the residents will need to bring these segregated wastes from their units to their allocated Waste Storage Areas (WSAs). The locations of WSAs can be viewed on the plans submitted with the application under separate cover.

The OWMP seeks to ensure that the proposed development contributes to the targets outlined in the *EMR Waste Management Plan 2015 – 2021*, *A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025* and the FCC *Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws* (2020).

18.4 Predicted Impacts of the Proposed Development

This section details the potential waste effects associated with the proposed development.

18.4.1 Do-Nothing Impact

If the proposed development were not to go ahead (i.e. in the Do-Nothing scenario) there would be no excavation or construction or operational waste generated at this site. There would, therefore, be a **neutral** effect on the environment in terms of waste.

The site is zoned for development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal, as described in the following sections.

18.4.2 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction (see **Appendix 18.1** for further detail). General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on site, in the construction site compound or adjacent to it, pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter and pollution issues is the presence of vermin, impacts on local biodiversity and the potential for downstream impacts on proximate watercourses and designated sites in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 9 (Land, Soils, Geology and Hydrogeology). It is anticipated that c. 7,640 m^3 of excavated material will be able to be retained and reused onsite, while the remaining c. 1,910 m^3 will be removed from site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

18.4.3 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant** and **negative**.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste that is not suitable for recycling is can be sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables, which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant** and **negative**.

Waste contractors will be required to service the proposed development on a scheduled basis to remove waste. Further details can be found in **Appendix 18.2**. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

18.5 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concept of the 'waste hierarchy' is employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal.

18.5.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development:

- As previously stated, c

18.5.2 Operational Phase

- As previously stated, a project specific OWMP has been prepared and is included as **Appendix 18.2**. The mitigation measures outlined in the OWMP will be implemented in full and form part of the mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to

reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the *EMR Waste Management Plan 2015 – 2021*, *A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy* and the FCC waste bye-laws.

- The Operator / Facilities Management of the site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the site of the proposed development.

In addition, the following mitigation measures will be implemented:

- The Operator / Facilities Management will ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):
  - Organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste electrical and electronic equipment (WEEE);
  - Batteries (non-hazardous and hazardous);
  - Cooking oil;
  - Light bulbs;
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
  - Furniture (and from time to time other bulky waste); and
  - Abandoned bicycles.
- The Operator / Facilities Management will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- The Operator / Facilities Management will ensure that all waste collected from the site of the proposed development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- The Operator / Facilities Management will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the proposed development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the *EMR Waste Management Plan (2015 - 2021)* and the FCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

18.6 Residual Impacts

The implementation of the mitigation measures outlined in Section 18.5 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the proposed development during the construction and operational phases. It will also ensure that EU, national and regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

18.6.1 Construction Phase

A carefully planned approach to waste management as set out in **Section 18.5.1** of this chapter, and adherence to the RWMP (which includes mitigation) (**Appendix 18.1**) during the construction phase will ensure that the predicted effect on the environment will be **short-term, imperceptible** and **neutral.**

18.6.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in **Section 18.5.2** of this chapter, and adherence to the OWMP (which includes mitigation) (**Appendix 18.2**), will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be **long-term, imperceptible** and **neutral.**

18.7 Monitoring

The management of waste during the construction phase will be monitored by the Contactor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the Operator / Facilities Management to ensure effective implementation of the OWMP internally and by the nominated waste contractor(s).

18.7.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e. progress and meeting construction schedule targets. The mitigation measures in the RWMP specify the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the proposed development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

18.7.2 Operational Phase

During the operational phase, waste generation volumes will be monitored by the Operator / Facilities Management against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

18.8 Interactions

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR.

18.8.1 Land, Soils, Geology & Hydrogeology

During the construction phase, excavated topsoil and subsoil (c. 9,550 m^3) will be generated from the excavations required to facilitate site levelling and construction of new foundations. It is anticipated that all c. 7,640 m^3 will be reused on site. It is anticipated that c. 1,910 m^3 of excavated material (c. will need to be removed off site. Where material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 9 and the requirements of the RWMP (**Appendix 18.1**), will ensure the effect is **long-term, imperceptible** and **neutral.**

18.8.2 Traffic & Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the proposed development. The increase in vehicle movements as a result of waste generated during the construction phase will be **temporary** in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be **imperceptible** in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 17 (Traffic & Transportation). Provided the mitigation measures detailed in Chapter 17 and the requirements of the OWMP (included as **Appendix 18.2**) are adhered to, the predicted effects are **short to long-term**, **imperceptible** and **neutral.**

18.8.3 Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and OWMP (**Appendices 18.1** and **18.2**, respectively), will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects predicted are **long-term, imperceptible** and **neutral**.

18.9 Cumulative Impacts

As has been identified in the receiving environment section, all cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such, any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

18.9.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase. The following permitted or proposed developments (as described in Chapter 21 – Cumulative Impacts) could potentially overlap with the construction phase of the proposed development:

- **PARTXI/012/21:** Church Fields Housing and Eastern Linear Park Development (is the housing and park progressing as one development or two) - Target commencement Sept 2023. Proposed end date Sept 2026;
- **PARTXI/011/19:** Church Fields Link Road and Cycle Network Development - Commenced on site in Jan 2022. Current target completion date Q4 2023;
- **PARTXI/010/19:** Church Fields Phase 2B, Mulhuddart, Dublin 15 - Commenced on site in October 2021. Current target completion date May/June 2023;
- **PARTXI/006/18:** Infill Dwellings at Wellview Estate, Mulhuddart, Dublin 15 - Commenced on site in Nov 2020. Current target completion date April 2023;
- **PARTXI/006/18:** Construction of 44 dwellings at Avondale, Mulhuddart, Dublin 15 - Commenced July 2018. Project complete Feb 2020.

Due to the high number of waste contractors in the FCC region, as provided from the National Waste Collection Permit Office and the EPA, there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all of the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the cumulative effect will be **short-term, imperceptible** and **neutral**.

18.9.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place, as discussed above. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate any potential cumulative impacts associated with waste generation and waste management. As such the cumulative effect will be a **long-term**, **imperceptible** and **neutral**.

18.10 Difficulties Encountered

Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works, as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

There are a number of licensed, permitted and registered waste facilities in the FCC region and in the surrounding counties. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity and serviceability.

18.11 References

- Waste Management Act 1996 (No. 10 of 1996) as amended.
- Environmental Protection Agency Act 1992 as amended.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
- Eastern Midlands Region Waste Management Plan 2015 – 2021 (2015).
- Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
- European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).
- Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022).
- Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
- Department of Communications, Climate Action and Environment (DCCAE), A Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
- DCCAE, Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021).
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- FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
- Fingal County Council (FCC), Fingal Development Plan 2023-2029 (2022).
- FCC, Fingal County Council Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws (2020).
- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- Planning and Development Act 2000 (No. 30 of 2000) as amended.
- Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015).
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- EPA, European Waste Catalogue and Hazardous Waste List (2002).
- EPA, National Waste Database Reports 1998 – 2020.
- US EPA, Characterisation of Building Uses (1998).
- EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015).

19 Material Assets – Services

19.1 Introduction

This chapter has been prepared by Waterman Moylan Consulting Engineers. This section examines the material assets serving the subject lands relating to water supply, wastewater, surface water drainage, gas, electricity, and telecommunications.

19.2 Method

The methodology followed for this section is in accordance with the EPA "Guidelines on the information to be contained in Environmental Impact Assessment Reports", EPA 2022. Information on built assets in the vicinity of the development lands was assembled from the following sources:

- A desktop review of Local Authority utility record plans, Uisce Éireann Utility Plans, ESB Networks Utility Plans, Gas Networks Ireland Service Plans, Eir e-maps and Virgin Media maps;
- Consultation with Uisce Éireann and Fingal County Council;
- Submission of a Pre-Connection Enquiry Application to Uisce Éireann;
- Review of ESB Network Utility Plans & site meetings with ESB Network;
- Review of Gas Networks Ireland existing network maps;
- Review of EIR Telecommunications existing network maps;
- Site Inspection / walkover;
- Commissioning of underground utility surveys and topographical surveys.

As part of assessing the likely impact of the proposed development, surface water runoff, foul drainage discharge and water usage calculations were carried out in accordance with the following guidelines:

- Greater Dublin Strategic Drainage Study (GDSDS), 2015;
- IS EN752, "Drain and Sewer Systems Outside Buildings", 2017;
- Irish Water Code of Practice (water demand and foul water loading), 2020.

19.3 Baseline Environment

19.3.1 Water Supply

Currently, there is an existing 300mm diameter watermain traversing the subject site from the southwest towards the northeast of the site. Uisce Éireann have granted a diversion application for this watermain, under DIV22229. The diverted watermain will run along Damastown Avenue to the north and then run southwards along the new Church Fields link road. A new watermain layout will be constructed in the near future for the site immediately to the west titled "Church Fields Housing and Eastern Linear Park", granted under FCC Ref: PART XI: 012/21 which will be fed from the Church Fields link road. The subject site will connect into the new network to the west and the existing network at Church Road, as instructed by Uisce Éireann in the Confirmation of Feasibility.

Refer to the standalone Engineering Assessment Report prepared by Waterman Moylan (2023) and submitted as part of the application.

19.3.2 Wastewater Sewers

It is proposed that the foul water from the entire Church Fields development will drain by gravity in a southwestern direction and discharge into the existing 900mm wastewater trunk sewer located along

the western boundary via a single outfall. The lands will be served by a 300mm diameter trunk sewer that branches off into each development area.

The impact of the foul flow based on the entire Church Fields lands (c. 1,000 No. units) on the Uisce Éireann network was assessed following the submission of a pre-connection enquiry form issued to Uisce Éireann. A Confirmation of Feasibility has been issued by Uisce Éireann on April 18th, 2023, which confirms capacity for the subject site in the surrounding network. In addition, a Statement of Design Acceptance for the proposed drainage design has been received from Uisce Éireann.

The outfall pipe from the development is a 300mm-diameter pipe laid at a minimum gradient of 1:200 which has sufficient capacity to serve all of the future development on the Church Fields lands, and outfall into the existing 900mm diameter infrastructure located approximately 800m to the west of the site. Therefore, there is adequate capacity in the public wastewater sewer available to cater for the proposed development. The proposed foul network has been designed with Causeway Flow software and will discharge via gravity.

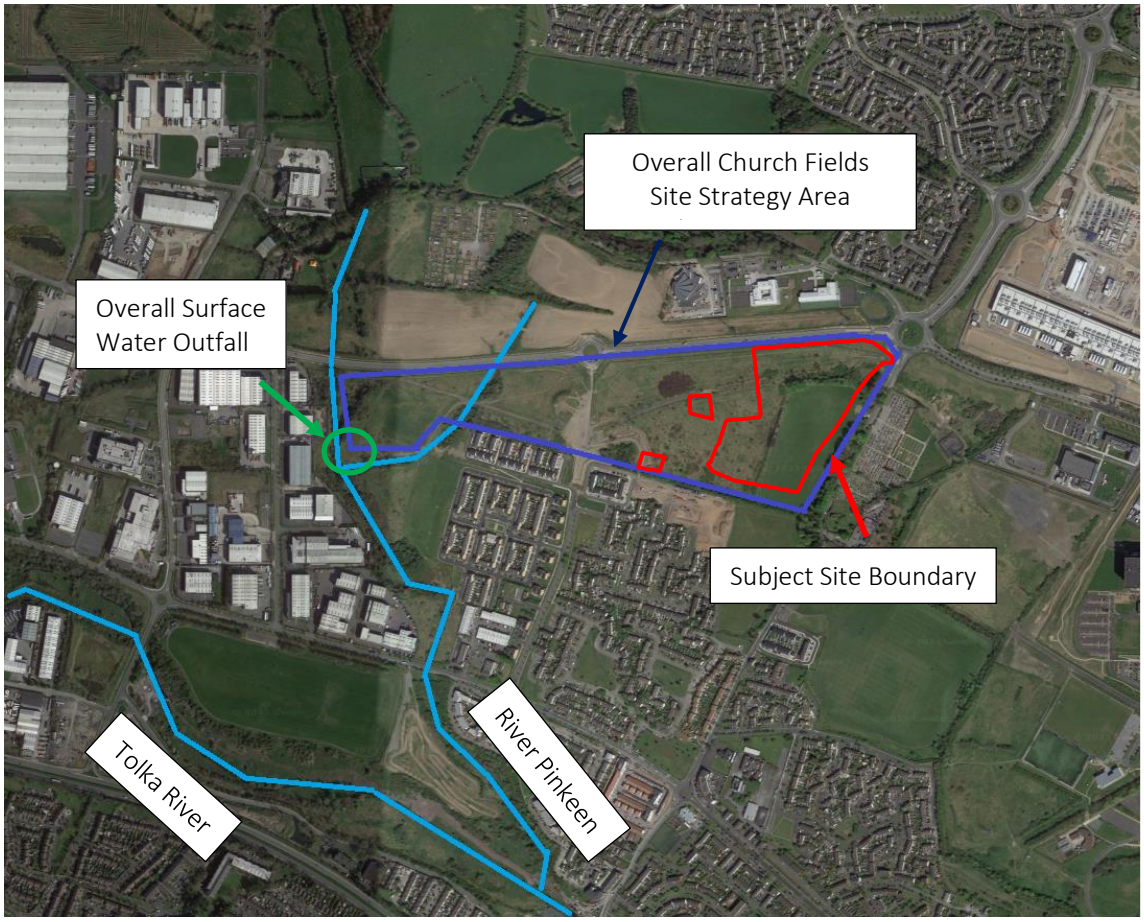
Refer to the standalone Engineering Assessment Report prepared by Waterman Moylan (2023) and submitted as part of the application.

19.3.3 Surface Water

The surface water from the overall Church Fields site strategy area lands flows westwards outfalling at the southwestern corner into the River Pinkeen via the existing infrastructure provided by the external roads project. The surface water from subject site will outfall into the Church Fields Housing and Eastern Linear Park permitted under FCC Ref: PART XI /012/21, drainage network to the west of the site. It is proposed that the surface water requirements will be served by a network of gravity pipes ranging in size from 225mm to 525mm diameter. The drainage catchment that will outfall at a restricted rate equal to 3.70 l/s/Ha. The surface water run-off from the subject site is attenuated on site or within the adjacent permitted site, the attenuation systems consist of an above ground detention basin combined with a supplementary below ground cellular storage area.

Refer to the standalone Engineering Assessment Report prepared by Waterman Moylan (2023) and submitted as part of the application.

Figure 19.1 Watercourses in Close Proximity to the Proposed Site



19.3.4 Gas

Gas Networks Ireland have been contacted and an existing gas network map for the area surrounding the proposed development has been obtained, Volume 3 (**Appendix 19.1**).

There are existing gas services within the roads around the subject site but none within the subject site and a 250dia 4 bar gas main passes through the site at the Eastern boundary.

19.3.5 ESB Supply

ESB Networks have been contacted and an existing ESB network map for the area surrounding the proposed development has been obtained, refer to Volume 3 (**Appendix 19.1**).

There is extensive ESB infrastructure in the areas surrounding the site, including LV below ground ducted services, 10KV below ground ducted services and 110kV high voltage overhead cables.

The 110KV overhead services also pass over the site at the north-eastern corner but there are no pylons cited within the site footprint.

19.3.6 Telecommunications

Eir and Virgin Media have been contacted and the existing network maps for the area surrounding the proposed development has been obtained, refer to Volume 3 (**Appendix 19.1**).

There are existing below ground ducted Eir and Virgin Media Services in the roads to the north, east and south of the site. There is also a trunk “dark fibre” ducted below ground service passing through the site at the eastern and southern boundaries.

19.4 Predicted Impacts of the Proposed Development

19.4.1 Do-Nothing Impact

In a do nothing scenario there will be no impact to the services as the built services and infrastructure at the site of the proposed development would likely remain as they are at present (as described above).

19.4.2 Construction Phase

Water Supply

- There is a risk of contamination of the existing water supply during construction of the development when connection of the trunk watermain to the public water supply is being made.
- There is a risk of damage to watermain fittings due to high pressure in the existing watermain.
- There will be a minor water demand for site offices.
- There is a possibility of a temporary increase in traffic due to deliveries of materials and other construction related traffic.
- There is a risk of damage to existing buried utilities during excavations works resulting in temporary loss of supply to existing properties.
- There is a potential for temporary impacts to the local water supply network, by way of disruption in water supply to the surrounding area. However, it is likely that this potential impact will have a *negative, non-significant, brief /temporary effect*.

Wastewater

- There is a risk of the ingress of ground/surface water to the foul water network.
- There is a risk of damage to existing buried utilities during excavations works resulting in temporary loss of supply to existing properties.
- There is a possibility of a temporary Increase in traffic due to deliveries of materials and other construction related traffic.
- There will be some disruption to traffic during construction works on the public road.
- Accidental cross connection between foul and surface water pipes.
- During the construction phase there will be no discharge of wastewater from the site, due to the provision of on-site facilities such as portable toilets. It is deemed a *neutral, imperceptible, short-term effect.*

Surface Water

- There is a risk that once topsoil has been stripped from the site there will be higher runoff rates from the lands with increased amount of silt to existing watercourses in the runoff.
  There is a risk of pollution of groundwater / watercourses / soils by accidental spillage of oils / diesel from temporary storage areas, from contaminated soil leachate or were maintaining construction equipment.
- There is a risk of pollution of groundwater / watercourses / soils by accidental spillage of oils / diesel from temporary storage areas, from contaminated soil leachate or were maintaining construction equipment.
- There is a risk of damage to existing buried utilities during excavations works resulting in temporary loss of supply to existing properties.
- There is a possibility of a temporary increase in traffic due to deliveries of materials and other construction related traffic.

- Accidental cross connection between surface water and foul pipes.
- Based on the points above in relation to the construction phase the potential impact on the hydrological environment is considered *negative, slight, temporary/short-term.*

Gas

- The installation of the utilities for the development will be conducted in parallel with the other services. This will mainly involve excavation of trenches to lay ducting, construction/installation of access chambers and backfilling of trenching. The trenching and backfilling works will be carried out in conjunction with the construction of the roads and footpaths throughout the scheme.
- Potential disruption to the Gas Networks Ireland infrastructure may occur while works are completed in the vicinity of the existing services.
- This likely impact may be characterised as a *negative, slight, temporary/short term effect*.

ESB Supply

- The installation of the utilities for the development will be conducted in parallel with the other services. This will mainly involve excavation of trenches to lay ducting, construction/installation of access chambers and backfilling of trenching. The trenching and backfilling works will be carried out in conjunction with the construction of the roads and footpaths throughout the scheme.
- Any works to connect to or divert existing ESB services may lead to loss of connectivity to and / or interruption of the supply from the electrical grid to the surrounding areas.
- This likely impact may be characterised as a *negative, slight, temporary/short term effect*.

Telecommunications

- The installation of the utilities for the development will be conducted in parallel with the other services. This will mainly involve excavation of trenches to lay ducting, construction/installation of access chambers and backfilling of trenching. The trenching and backfilling works will be carried out in conjunction with the construction of the roads and footpaths throughout the scheme.
- Potential loss of connection to the telecommunications infrastructure while carrying out works to provide service connections. This likely impact may be characterised as a *negative, slight, temporary/short term effect.*

19.4.3 Operational Phase

Water Supply

- There will be an increased demand for water once the development is occupied.
- The potential impact of the operational phase on the water supply is likely to have a *neutral, imperceptible, long-term effect*.

Wastewater

- Blockages may occur within the pipe network and the wastewater could become septic.
- Wastewater could leak into or combine with the surface water drainage network.
- Increased flows to the wastewater network and the Ringsend wastewater treatment plant.
- The potential impact of the operational phase on the receiving wastewater network is likely to have a *neutral, imperceptible, long-term effect*.

Surface Water

- There is a potential impact from increased surface water flows that could lead to downstream flooding.

- There is a potential impact for the discharge of contaminants from the proposed development and road surfaces to the surrounding drainage sewers. These would include particulates, oil, soluble extracts from the bitumen binder etc. The quality of runoff from the site would be dependent on the time of year, weather, particulate deposition from the atmosphere and any gritting or salting carried out by the Local Authority. The time of year has a major bearing on the quality of storm water run-off - in particular the first rains after a prolonged dry period where accumulated deposits of rubber, particulates, oils, etc. are, washed away.
- Stagnation of the water and siltation within the attenuation areas may occur.
- Based on the points above in relation to the operational phase, the potential impact on hydrology and the receiving water network is considered to have a *positive, slight, long-term effect*.

Gas

- No gas connection is being sought for the site. Therefore the impact is deemed to be *neutral, imperceptible, and long term effect.*

ESB Supply

- There will be an increase in the demand and usage of electricity in the area once the proposed development is operational. The impact is deemed to be *neutral, imperceptible, and long term effect.*

Telecommunications

- There will be an increase in the demand for broadband bandwidth in the area once the proposed development is operational. Therefore the impact is deemed to be *neutral, imperceptible, and long term effect.*

19.5 Mitigation Measures

19.5.1 Construction Phase

Water Supply

- All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position is accurately identified before excavation works commence.
- All water mains will be cleaned, sterilised, and tested to the satisfaction of the Uisce Éireann /Local Authority prior to connection to the public water main.
- All connections to the public water main will be carried out under the supervision of the Uisce Éireann /Local Authority.

Wastewater

- All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position accurately identified before excavation works commence.
- Foul water pipes to be laid with sufficient falls to ensure self-cleansing velocity.
- Foul pipes will be carefully laid so as to minimise the potential for cross connections.

Surface Water

- The contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.
- Regular testing of surface water discharges will be undertaken at the outfall from the subject site.

- Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The cleaned system will start working again.
- Careful removal of contaminated material from site during the works in accordance with an approved plan.
- All fuels and chemicals will be bunded, and where applicable, stored within double skinned tanks / containers with the capacity to hold 110% of the volume of chemicals and fuels contents. Bunds will be located on flat ground a minimum distance of 50 m from any watercourse or other water conducting features, including the cut off trenches.
- All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position is accurately identified before excavation works commence.
- Temporary traffic management will be implemented as appropriate during the construction of the connections at tie-in to existing surface water networks.
- Surface Water pipes will be carefully laid so as to minimise the potential for cross connections.

Gas

- All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position accurately identified before excavation works commence.
- The contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.
- Any works required on existing gas mains will be completed directly by the Gas Networks Ireland or by the specialist sub-contractors appointed on their behalf and any loss of supply will be managed by Gas Networks Ireland.

ESB Supply

- All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position accurately identified before excavation works commence.
- The contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.
- All connections to the existing ESB Network will be completed directly by ESB Networks and any loss of supply will be managed by ESB Networks to minimise impact on neighbouring properties.

Telecommunications

All connections to the existing telecoms infrastructure will be completed directly by the telecoms providers or by the specialist sub-contractors appointed on their behalf and any loss of supply will be managed by the respective telecoms providers to minimise impact on neighbouring properties.

19.5.2 Operational Phase

Water Supply

- It is not envisaged that any other remedial or reductive measures will be necessary upon the completion of the development.

Wastewater

- The foul network will be inspected and maintained as required.

Surface Water

- Flow restrictors with attenuation storage will be used to slowdown and store surface water runoff from discharging above green field rates to the receiving network.

- Attenuation systems will be constructed on-line to intercept the first flush during rainfall events after periods of dry weather.
- Sustainable urban drainage measures such as permeable paving, green roofs, infiltration trenches, and rain gardens will be provided.
- A petrol interceptor will be installed to prevent hydrocarbons entering the local drainage system.
- The attenuation storage systems will be constructed at a fall to maintain movement of water and thus prevent stagnation. Silt would be collected at a sump and removed periodically.
- Regular maintenance of the drainage network including petrol interceptor shall be undertaken.
- The drainage network will be inspected annually and maintained.

Gas

- All works will be completed in accordance with Gas Networks Ireland's details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.

ESB Supply

- All works will be completed in accordance with ESB details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.

Telecommunications

- All works will be completed in accordance with the relevant utility providers details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.

19.6 Residual Impacts

Once the identified mitigation measures, appropriate design standards and operational infrastructure management plans are adhered to it is considered that any impacts on the material assets surrounding the proposed development will be *neutral, imperceptible and long-term*.

19.7 Monitoring and Reinstatement

The proposed monitoring of the various built services during the operation stage will include:

- The water usage within the proposed development will be monitored via the bulk water meters. Records will be maintained by Uisce Éireann to ensure any excess usage is identified and investigated as necessary.
- Uisce Éireann will monitor the operation of the foul drainage network including the receiving environment.
- The construction and waste management plans will be adhered to.
- The provision of utility services including electricity and broadband will be monitored by the relevant utility providers.

19.8 Interactions

The main interactions relating to this EIAR chapter are Chapter 9 Land, Soils, Geology and Hydrogeology, Chapter 10 Hydrology, and Chapter 17 Traffic and Transport.

During construction stage, the connection of wastewater services has the potential to impact the local surface water from a hydrology and hydrogeology perspective. There are potential implications for the local populations if there is a disruption to utility services during the connection of the new services to

the proposed development. The construction of the various services will also interact with construction traffic as outlined in the Traffic and Transportation Chapter.

During the operation stage, the water supply and foul drainage services have a potential interaction with the available water supply and with potential pollution to natural water bodies.

19.9 Cumulative Impacts

Chapter 21 of the EIAR lists existing / proposed plans and projects in the vicinity of the proposed development.

Most impacts that have been identified are mitigated by design or good practice. This reduces the impact magnitude to neutral and the effects are considered to be imperceptible. Assuming other relevant developments (those identified in Chapter 21 of this EIAR) will be of a similar nature and incorporate similar design and widely adopted good practice mitigation, it is considered unlikely that there will be significant cumulative effects.

19.10 Difficulties Encountered

There were no difficulties encountered compiling this chapter.

19.11 References

- Code of Practice for Water Infrastructure – Connections and Developer Services, (2020), Irish Water.
- Code of Practice for Wastewater Infrastructure – Connections and Developer Services, (2020), Irish Water.
- Eircom e-maps.
- Guidelines on the information to be contained in Environmental Impact Assessment Reports - EPA 2022
- ESB Networks and Health and Safety Authority (2019). *Code of Practice for Avoiding Danger from Overhead Electricity Lines.*
- Gas Networks Ireland (2018). *Guidelines for Designers and Builders – Industrial and Commercial (Non-Domestic) Sites.*
- Greater Dublin Strategic Drainage Study (GDSDS), (2015), Dublin Drainage.
- Irish Building Regulations – Part H 2010 – Drainage and Wastewater Disposal.

20 Interactions

20.1 Introduction

This chapter provides an overview of the key interactions identified and addressed in the foregoing chapters of the EIAR.

It is a requirement of the EIA Directive that, not only are the impacts in respect of the individual specialist topics (hydrology, biodiversity, air quality and climate, etc.) to be addressed in the EIAR, but so too must the interactions and inter-relationships between these topics be addressed. As stated in Article 3 of the amended Directive:

> "*The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> *(a) population and human health;*
>
> *(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
>
> *(c) land, soil, water, air and climate;*
>
> *(d) material assets, cultural heritage and the landscape;*
>
> *(e) the* ***interaction*** *between the factors referred to in points (a) to (d).*"

The EPA guidelines state that interactions should be addressed, where relevant, in the corresponding specialist EIAR chapters, with an 'interactions matrix' and brief text provided by way of summary:

> *"The interactions between effects on different environmental factors should be addressed as relevant throughout the EIAR. For example, where it is established in the Hydrology section that there will be an increase in suspended solids in discharged surface waters during construction, then the Biodiversity section should assess the effect of that on sensitive aquatic receptors. […] It is general practice to include a matrix to show where interactions between effects on different factors have been addressed. […] This is typically accompanied by text describing the interactions." (Section 3, p. 56).*

A brief description of these interactions is presented below, as is an interactions matrix (Table 20.1).

Note that this chapter provides an overview of the potential impacts that may arise as a result of interactions between environmental topics, and as a direct or indirect result of the proposed development. It does not repeat the detailed characterisation of these impacts, or reiterate any mitigation measures that have been prescribed in relation to them. These are addressed under the scope of the corresponding EIAR chapters, as referenced below.

Table 20.1 Interactions matrix

Source \ Receptor	Population & Human Health	Biodiversity	Land, Soils, Geology & Hydrogeology	Hydrology	Air Quality	Climate	Noise & Vibration	Landscape & Visual	Cultural Heritage, Archaeology and Architectural	Microclimate – Daylight & Sunlight	Traffic & Transportation	Material Assets - Waste	Material Assets - Services
Population & Human Health					✓		✓	✓		✓	✓	✓	✓
Biodiversity			✓	✓	✓			✓					
Land, Soils, Geology & Hydrogeology		✓		✓	✓						✓		
Hydrology		✓	✓		✓	✓							
Air Quality	✓	✓	✓			✓					✓		
Climate		✓	✓	✓						✓	✓	✓	
Noise & Vibration	✓	✓									✓		
Landscape & Visual		✓	✓										
Cultural Heritage, Archaeology and Architectural Heritage			✓										
Microclimate – Daylight & Sunlight	✓												
Traffic & Transportation	✓			✓	✓	✓	✓					✓	
Material Assets – Waste	✓		✓								✓		
Material Assets - Services			✓	✓							✓		

20.2 Summary of Interactions

Interactions addressed in this EIAR are discussed under the headings of the corresponding receptor topics / media, below.

20.2.1 Population and Human Health

Population and human health is an EIA topic that tends to interact with numerous other topics. Where the potential for impacts on population and human health has been identified as a result of such interactions, these have been addressed comprehensively in Chapter 7 (Population & Human Health). In respect of the proposed development, the noteworthy interactions between population and human health and other topics, in the absence of mitigation, may be summarised as follows:

Air Quality (Chapter 11)

- Potential for nuisance impacts due to dust-generating activities of proposed works.

Noise & Vibration (Chapter 13)

- Potential for nuisance and disturbance due to noisy construction activities, plant and equipment;
- Potential for nuisance and disturbance due to construction traffic noise;
- Potential for nuisance and disturbance due to the traffic on the surrounding roads during operational phase; and
- Potential for nuisance and disturbance due to additional traffic during operational phase.

Landscape & Visual (Chapter 14)

- Negative impacts on landscape and visual amenity due to presence of construction site and effects of construction activities (e.g. dust, dirt, stockpiling of soils, removal of vegetation, etc.);
- Visual impacts due to completion of proposed development, establishing substantial new residential.

Traffic & Transportation (Chapter 17)

- Potential for negative impacts on journey characteristics due to additional (construction) traffic on road network during proposed works;
- Potential for nuisance and disturbance due to construction traffic noise;
- Potential for negative impacts on journey characteristics due to additional traffic on road network during the operational phase; and
- Potential for nuisance and disturbance due to operational traffic noise.

Microclimate- Daylight & Sunlight (Chapter 16)

- Potential impacts due to changes to daylight and sunlight availability on the receiving environment.

Material Assets- Waste (Chapter 18)

- Potential health impacts related to improper waste management.

Material Assets- Services (Chapter 19)

- Potential health impacts related to improper safety protocols, e.g. related to diversions of gas / power lines;
- Nuisance / impacts on residential amenity due to potential service / power outages.

20.2.2 Biodiversity

Where the potential for impacts on biodiversity has been identified as a result of interactions with other EIA topics, these have been addressed comprehensively in Chapter 8 (Biodiversity) and / or the corresponding other specialist chapter. In respect of the proposed development, the noteworthy interactions between biodiversity and other topics, in the absence of mitigation, may be summarised as follows:

Land, Soils, Geology & Hydrogeology (Chapter 9)

Effects and impacts in relation to the geological and hydrogeological environment have the potential to negatively affect biodiversity. For example, soil stripping and excavations on the site will result in the loss of existing habitats. There is also the potential for negative impacts on aquatic ecology due to discharge of sediment-laden run-off and / or groundwater pollution during the proposed works.

Hydrology (Chapter 10)

Effects and impacts in relation to surface water have the potential to negatively affect biodiversity. For example, unmitigated water quality impacts may result in negative impacts on aquatic ecology.

Air Quality (Chapter 11)

Dust emissions from construction works have the potential to impact vegetation in the vicinity of the site. Vehicular emissions during construction and operation also have the potential to impact vegetation as a result of NOx emissions leading to nitrogen deposition.

Landscape & Visual (Chapter 14)

The landscape design for the proposed development takes into account the requirements to maximise the benefits to biodiversity, both locally and within the wider landscape. The landscape scheme proposes significant ecologically sensitive planting to provide for potentially diverse habitats.

20.2.3 Land, Soils, Geology and Hydrogeology

The main interactions of importance to land, soils, geology, and hydrogeology relate to Biodiversity (Chapter 8), Hydrology (Chapter 10), and Air Quality (Chapter 11) as follows.

Biodiversity (Chapter 8)

The proposed development may have temporary negative impacts on biodiversity at site level, while it will not impose any significant impact on European Designated sites, the proposed development will cause a loss of a proportion of treeline / hedgerow in the northern part of site which will result in impacts on nesting birds and commuting bats.

Hydrology (Chapter 10)

The Pinkeen River is a tributary of the Tolka river which flows west of the proposed development and does not flow through the site boundary. Therefore, there is no evidence of a source pathway linkage to the underlying aquifer and no evidence of soil contamination. There is a Spring downgradient of the site, this acts as a receptor.

Air Quality (Chapter 11)

During construction of the proposed development, there will be a proportion of dust created that will impact air quality.

Traffic and Transportation (Chapter 17)

Local Traffic and transportation will be implemented by the additional vehicle movements generated by the volume of excavated soil that will have to be transported off site, resulting in an increase of heavy good vehicles (HGVs) during construction. The increase in vehicle movements as a result of excavated soil removal during the construction phase will be temporary in duration. Traffic-related impacts during the construction and operational phases are addressed in Chapter 17 (Traffic & Transportation).

20.2.4 Hydrology

Where the potential for impacts on hydrology has been identified as a result of interactions with other EIAR topics, these have been addressed comprehensively in this EIAR. In respect of the proposed development, the noteworthy interactions with hydrology and other topics / media, in the absence of mitigation, are summarised as follows:

Biodiversity (Chapter 8)

The proposed development may have temporary negative impacts on biodiversity at site level, while it will not impose any impact on water quality within European Designated sites.

Climate (Chapter 12)

The proposed development will not have negative impact on flood risk as a result of climate change. The proposed development is located within Flood Zone C. The proposed drainage plan incorporates adequate attenuation taking consideration of a climate safety factor.

Land, Soil, Geology, and Hydrogeology (Chapter 9)

In the absence of manmade drainage infrastructure during construction, stormwater run-off will continue to discharge to ground.

Air Quality (Chapter 11)

During construction of the proposed development, there will be a proportion of dust created that will impact air quality locally if not adequately mitigated.

20.2.5 Air Quality

Where the potential for impacts on air quality has been identified as a result of interactions with other EIA topics, these have been addressed comprehensively in this EIAR. In respect of the proposed development, the noteworthy interactions between air quality and climate and other topics, in the absence of mitigation, may be summarised as follows:

Population and Human Health (Chapter 7)

An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits.

Traffic and Transportation (Chapter 17)

With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site.

Climate (Chapter 12)

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter (Chapter 12). There is no impact on climate due to air quality however the sources of impacts on air quality and climate are strongly linked.

Land, Soil, Geology, and Hydrogeology (Chapter 9)

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils. Dust generation can occur during extended dry weather periods as a result of construction traffic. Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods and vehicle wheel washes will be installed, for example.

Biodiversity (Chapter 8)

The works involve stripping of topsoil and excavations, which will remove some vegetation such as trees and scrub. It will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary during construction phase and is not anticipated to have a significant impact on biodiversity.

20.2.6 Climate

Climate has the potential to interact with a number of other environmental attributes, including Chapter 8 (Biodiversity), Chapter 9 (Land, Soils, Geology and Hydrogeology), Chapter 10 (Hydrology), Chapter 16 (Microclimate (Daylight and Sunlight)) Chapter 17 (Traffic and Transportation) and Chapter 18 (Material Assets -Waste).

Interactions occur due to the impact on the chapter from climate change occurring (i.e. biodiversity or hydrology) or due to GHG emissions being generated (i.e. Material Assets – Waste or Traffic and Transportation).

The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with a minimum 1 in 100-year event plus 20% climate change allowance.

Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling.

In addition, climate impacts will interact with the proposed developments design both with respect to embodied carbon but also through its vulnerability to future climate change impacts (e.g. wind loading, extreme temperatures). The building detailed design will be finalised with potential future climate

hazards in mind. Building design will also take into account energy efficiency measures to reduce construction phase and operational carbon emissions.

20.2.7 Noise & Vibration

Noise and vibration (Chapter 13) interacts with **Traffic and Transportation (Chapter 17),** in that increased traffic volumes during the construction and operational phases have the potential to increase background noise levels.

Other potential interaction between noise and vibration and other specialist chapters in the EIAR are primarily limited to Chapter 7 (Population & Human Health), Chapter 8 (Biodiversity), as noisy construction activities, plant and equipment and construction traffic has potential to impact on nearby receptors during the construction phase.

20.2.8 Landscape & Visual

Where the potential for impacts on landscape and visual has been identified as a result of interactions with other EIA topics, these have been addressed comprehensively in this EIAR. In respect of the proposed development, the noteworthy interactions between landscape and vidual and other topics, in the absence of mitigation, may be summarised as follows:

Biodiversity (Chapter 8)

The removal of existing vegetation will have a slight, negative interaction with landscape and visual aspects. The landscape masterplan provides for significant additional planting and provision of wildflower grasslands which will enhance local biodiversity.

Land, Soils, Geology and Hydrogeology (Chapter 9)

The removal of existing topsoil will have a slight, negative interaction with landscape and visual aspects. The landscape scheme provides for reuse of a portion of retained topsoil within gardens and open space areas.

20.2.9 Cultural Heritage, Archaeology and Architectural Heritage

Interaction with **Land, Soils, Geology and Hydrogeology (Chapter 9)** was identified as previous disturbance for archaeological inspection was undertaken within the proposed development site. No other future interactions were identified as part of the assessment.

20.2.10 Microclimate - Daylight & Sunlight

Microclimate- Daylight and Sunlight (Chapter 16) interacts with **Population and Human Health (Chapter 7)** since impacts in relation to daylight and sunlight availability, e.g. overshadowing of neighbouring buildings, can negatively or positively affect residential amenity in the receiving environment.

20.2.11 Traffic & Transportation

The key interactions between traffic and transportation and other EIAR topics are as follows:

Population and Human Health (Chapter 7)

Impacts on the operation of the local road network, and traffic-related noise and air quality effects have the potential to affect the local population.

Air Quality and Climate (Chapter 11 &12)

Vehicular emissions contain air pollutants, including greenhouse gases with climate impacts, and gases / particulates with potential human health impacts.

Hydrology (Chapter 10)

There may also be interactions with the surrounding water bodies through surface water runoff topsoil stripping and earthworks which will be required to construct the roads.

Noise and Vibration (Chapter 12)

Traffic generates noise, with the associated potential for adverse human health impacts.

Material Assets – Waste (Chapter 17)

Waste generated on site will have to be transported off-site generating traffic on surrounding roads.

No significant impacts on traffic and transportation are predicted in relation to any of the above-listed interactions. For further information, refer to Chapter 17 and the above-listed other specialist chapters.

20.2.12 Material Assets - Waste

The identified interactions between the management of waste arisings during both the construction and operational stages are as follows:

Land, Soils, Geology & Hydrogeology

During the construction phase, excavated topsoil and subsoil (c. 9,550 m^3) will be generated from the excavations required to facilitate site levelling and construction of new foundations. It is anticipated that all c. 7,640 m^3 will be reused on site. It is anticipated that c. 1,910 m^3 of excavated material (c. will need to be removed off site. Where material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort.

Traffic & Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the proposed development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase. Traffic-related impacts during the construction and operational phases are addressed in Chapter 17 (Traffic & Transportation).

Population & Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction and / or operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP and OWMP (**Appendices 18.1** and **18.2**, respectively), will ensure appropriate management of waste and avoid any negative impacts on the local population.

20.2.13 Material Assets - Services

The main interactions relating to this EIAR chapter are **Chapter 9 Land, Soils, Geology and Hydrogeology**, **Chapter 10 Hydrology**, and **Chapter 17 Traffic and Transport**.

During construction stage, the connection of wastewater services has the potential to impact the local surface water from a hydrology and hydrogeology perspective. There are potential implications for the local populations if there is a disruption to utility services during the connection of the new services to the proposed development. The construction of the various services will also interact with construction traffic as outlined in the Traffic and Transportation Chapter.

During the operation stage, the water supply and foul drainage services have a potential interaction with the available water supply and with potential pollution to natural water bodies.

21 Cumulative Impacts

21.1 Introduction

This chapter discusses the potential for cumulative impacts to arise as a result of the proposed development in combination with other projects.

Annex III (3)(g) of the EIA Directive requires the EIAR to include the potential for significant cumulative effects of projects on the environment and it states to include "*the cumulation of the impact with the impact of other existing and/or approved projects*." Annex IV (5)(e) of the EIA Directive states that EIAR should include "*the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources*."

The European Commission *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions* (1999) define cumulative impacts as "*Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project"* (p. iii).

Similarly, the EPA guidelines define cumulative effects as *"The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects"* (Section 3, p. 52). The EPA guidelines further state that:

> *"While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable; however, it may be necessary to assess the cumulative effects taking account of traffic generated by other permitted or planned projects. It can also be prudent to have regard to the likely future environmental loadings arising from the development of zoned lands in the immediate environs of the proposed project."* (Section 3, p. 54)

21.2 Assessment of Cumulative Impacts

Cumulative impacts have been assessed by taking account of the baseline environment and the predicted impacts of the construction and operation of the proposed development in combination with those of any other existing and / or permitted projects in the zone of influence.

Each of the specialist contributors to this EIAR have considered the potential for cumulative impacts to arise, with particular reference to the projects listed in this Chapter.

This EIAR has considered three categories of plans / projects in the vicinity of the proposed development based on the following:

- Existing or commenced projects with a valid planning permission within the vicinity of the proposed development that have the potential for significant cumulative effects with the proposed development;
- Approved projects with a valid planning permission that have not commenced construction within the vicinity of the proposed development that have the potential for significant cumulative effects with the proposed development; and
- Proposed projects that do not have planning permission but have the potential for significant cumulative effects with the proposed development.

21.3 Key Plans & Developments

A search for other developments that may have the potential to result in cumulative impacts with the proposed development was carried out, and a list of key developments for consideration was developed (Table 21.1). In identifying these developments, the following principal sources were consulted (as of 15 May 2023):

- Fingal County Council planning portal;
- Fingal County Council weekly lists of applications received;
- An Bord Pleanála (ABP) website;
- Department of Housing, Local Government and Heritage EIA Portal;
- *Fingal Development Plan 2023-2029.*

Table 21.1 provides a list of relevant permitted and proposed developments in the vicinity of the site, which have been given due consideration in the assessment of potential cumulative impacts. Figure 21.1 maps these developments in relation to the proposed development site.

It is noted that the list of developments in this Chapter is non-exhaustive. There are a wide variety of other applications and permissions in the area. However, minor developments, such as one-off housing, erection of signage and other minor structures and extensions, have been excluded due to the exceedingly low likelihood of significant cumulative impacts. Lapsed and refused permissions have also been excluded.

21.4 Conclusion

For topic-specific assessments of the potential for cumulative impacts, please refer to the foregoing specialist EIAR chapters. Assuming the full and proper implementation of the mitigation measures set out in this EIAR, no significant negative cumulative impacts are likely to arise during the construction or operational phases of the proposed development.

Table 21.1 Permitted and proposed developments to which regard has been had in the assessment of potential cumulative impacts

Reference	Applicant	Location	Description – overview	Status	Environmental Assessments
Existing Developments					
PARTXI/002/17	Fingal County Council	Avondale, Mulhuddart, Dublin 15	Construction of 44 new dwelling units, and associated site development and external works.	**Completed**	-
Permitted developments					
PARTXI/012/21	Fingal County Council	Church Fields, Mulhuddart, Dublin 15	Construction of 300 no. dwellings, 1 no. crèche facility, 1 no. communal facility, 2 no. retail units, Eastern Linear Park and all associated site development works on a 9.47 ha site at Church Fields, Mulhuddart, Dublin 15, and amendments of a section from Damastown Avenue to Wellview Avenue of the previously permitted Church Fields Link Road and Cycleway Networks Project (FCC Planning Ref. No.: PARTXI/011/19).	Proposed construction commencement in Q4 2023; Lodged 09 December 2021; Decision 14 March 2022.	-
PARTXI/010/19	Fingal County Council	Church Fields, Mulhuddart, Dublin 15	Construction of 70 no. dwellings, including 7 x 1-bed units, 19 x 2-bed units, 34 x 3-bed units and 10 x 4-bed units. All associated site development works including access road, footways, site boundaries, open space, drainage, public lighting, utilities and services. All dwellings will be provided with private external open space (gardens), and there will be a mix of 116 in-curtilage and 20 off street parking bays, a total of 136 bays.	Under construction Lodged 09 December 2019; Decision 10 February 2020	EIA Screening Report, AA Screening Report
PARTXI/011/19	Fingal County Council	Church Fields, Mulhuddart, Dublin 15	Construction of a 690m link road (comprising of 380m upgrade of existing Wellview Avenue and 310m new construction) linking Ladyswell Road to the south and Damastown Avenue to the north. Provision of 3m wide vehicle lanes in each direction along the link road with 3m wide tree lined central median to separate lanes. Provision of 3m wide footpath, 2m wide off-road cycle tracks and 1.75m wide tree lined verge on each side of the link road. Provision of junction accesses to existing and future developments with National Cycle Manual compliant pedestrian and cyclist junction crossings. Provision of pedestrian crossings and toucan crossings at various locations along the proposed link road, Damastown Avenue and on the	Under construction	EIA Screening Report

Reference	Applicant	Location	Description – overview	Status	Environmental Assessments
			arms of the existing roundabouts on Damastown Avenue. Provision of a cycle friendly roundabout on the link road. Construction of a 1.5km long 4m wide 2-way off-road cycle track with 3m wide pedestrian footpath along Damastown Avenue linking the proposed new link road to the two schools on the Powerstown road and the proposed parkland adjacent to Church Road. The combined new cycle-track and footway will connect to the existing footpath and cycle infrastructure in the surrounding area. Fencing, earthworks and pavement, utility provisions, drainage, landscaping and accommodation works. All associated site works.		
PARTXI/006/18	Fingal County Council	Wellview, Mulhuddart, Dublin 15	Construction of 20 no. dwellings and all associated site development works, including 4 no. 2-bedroom, 3-person, 2-storey house, 3 no. 2-bedroom, 3-person, 2-storey houses, 7 no. 3-bedroom, 5-person, 2-storey houses, 6 no. 4-bedroom, 7-person, 2-storey houses. All dwellings will be provided with private open space. A total of 44 no. car parking spaces will be provided across the development.	Under construction Lodged 25 February 2019; Decision 08 April 2019	EIA Screening Report, AA Screening Report
PARTXI/001/22	Fingal County Council	Wellview, Mulhuddart, Dublin 15	Fingal County Council (Architects Department) applied for permission at Wellview Park, Wellview Green and Wellview Terrace comprising of rejuvenation and upgrade Wellview Park and two existing areas of public realm in Wellview Green and Wellview Terrace. Works included pedestrian access points, footpath upgrades, paving and associated drainage works.	Planning permission was granted on 10th October 2022.	EIA Screening Report
TA06F.312271	Glenveagh Homes Limited	Lands at Hollystown-Kilmartin, Dublin 15	Demolition of an existing shed, construction of 548 no. residential units (401 no. houses, 147 no. apartments), 2 no. creches and associated site works.	Permission granted 23 March 2023; Lodged 17 December 2021.	EIAR; AA Screening Report
FW22A/0287	Powerstown Educate Together	Powerstown Educate Together National School, Powerstown Road, Tyrellstown, D15VR80	The works will consist of the construction of a two storey special needs accommodation unit (997sqm.) to side of existing school to include a central activities space, 5 No. classrooms, toilets and shower areas and ancillary spaces with minor	Permission granted 10 March 2023	

Reference	Applicant	Location	Description – overview	Status	Environmental Assessments
	National School		alterations to existing school facade at ground and first floor to facilitate connection to the extension. External works will include 12 No. additional parking spaces, play area (200sqm) and sensory garden (100 sqm) together with all associated site works.		
FW22A/0156	Earlstand Corporation Unlimited Company	Mooretown and Northwest Logistics Park, Ballycoolin, Dublin 15	Construction of 6 no. warehouses/logistics units including ancillary office/administration use and entrance/reception areas over two levels (Units 1-6). Ancillary ESB substations (6 no. in total) are included for each of the proposed warehouses/logistics units. The proposal includes a new estate road entrance from Kilshane Avenue, access arrangements and internal road network to serve the proposed units, and pedestrian and cycle infrastructure. The units are served by a total of 501 no. car parking spaces, 230 no. cycle spaces, 80 no. heavy goods vehicle parking spaces (including loading bay parking), loading bays and service yard areas. The proposed includes PV panels at roof level, hard and soft landscaping and planting, boundary treatments , public open spaces and woodland areas, security gates, cycle shelters, lighting, entrance signage, signage zones for each of the proposed units and all associated works including underground foul and storm water drainage network, attenuations rea, SUDS features and utility cables.	Under construction; Permission granted 11 October 2022	EIAR; AA Screening Report
FW22A/0066	Earlstand Corporation Unlimited Company	A site (known as site A), located to the north of Northwest Logistics Park, (NWLP), Ballycoolin, Dublin 15	Construction of a high technology manufacturing unit (for the manufacturing of high technology electrical components. Provision of a link corridor between the proposed high technology manufacturing unit and Unit 900 to the south (logistics/warehouse unit permitted under Reg. Ref. FW21A/0146); The provision of 562 no. car parking spaces, dedicated bus drop off and 275 no. bicycle parking spaces along with HGV loading bays and a service yard to the west of the proposed unit. The vehicular access to the unit will be provided via two entrances from the roundabout proposed	Permission granted 07 July 2022	EIAR; AA Screening Report

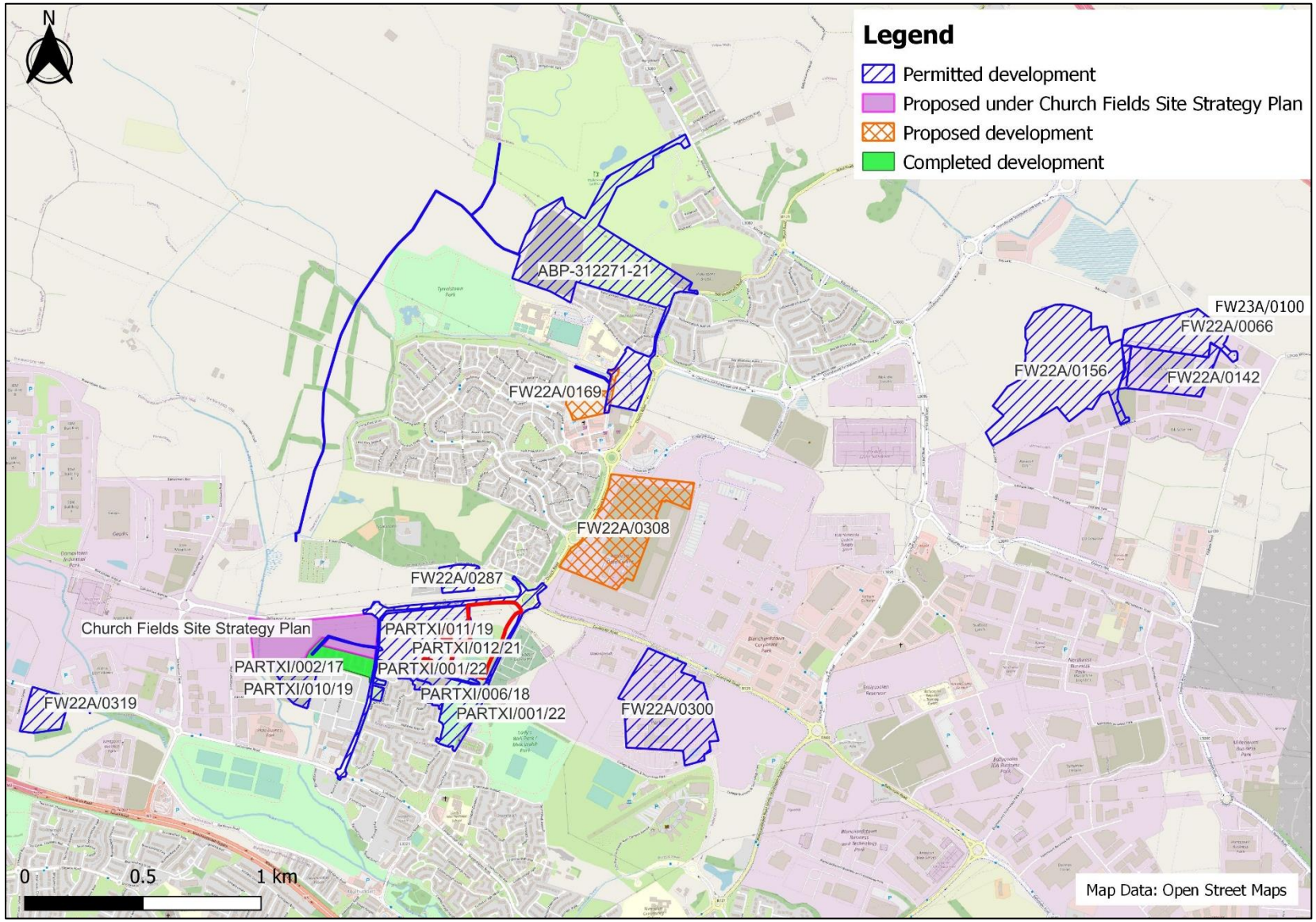
Reference	Applicant	Location	Description – overview	Status	Environmental Assessments
			under Reg. Ref. FW21A/0146, which provides access to Kilshane Avenue to the east. The development also includes rooftop plant for the proposed unit, an ESB substation with switchroom, 2 no. emergency generators, 2 no. sprinkler/water tanks and 2 no. pumphouses, 2 no. smoking shelters, bicycle shelters, landscaping, boundary treatments, entrance gates, site lighting, all associated site development works, underground foul and storm water drainage services and attenuation areas including connections to existing/permitted services infrastructure and all ancillary works.		
FW21A/0146	Earlstand Corporation Unlimited Company	A site (known as site A), located to the north of Northwest Logistics Park, (NWLP), Ballycoolin, Dublin 15	Construction of 1 no. warehouse / logistics unit, with a maximum building height of 17.09 metres. The proposal includes a signage zone for the proposed unit. The provision of 181 no. car parking spaces, 60 no. cycle parking spaces, HGV loading bays and service yard area; The access to the unit will be provided by extending the existing Kilshane Avenue access road serving Northwest Logistics Park (including alterations to the existing road layout). The development also includes an ESB substation, a smoking shelter, a sprinkler tank with a pumphouse and valvehouse, landscaping, boundary treatments, entrance gates, site lighting, and all associated site development works, underground foul and storm water drainage services (including a connection to an existing pumphouse to the southwest of the proposed warehouse / logistics unit) and attenuation areas.	Permission granted 15 February 2022	EIAR; AA Screening Report
FW22A/0142	Earlstand Corporation Unlimited Company	Site to the north of Northwest Logisticstic Park, (Formerly known as Northwest Business Park), Ballycoolin, Dublin 15	Planning permission for the retention and completion of amendments to the development permitted under Reg. Ref.: FW21A/0146 on a site to the north of Northwest Logistics Park, Ballycoolin, Dublin 15 (formerly known as Northwest Business Park). The application site is located to the west of Kilshane	Permission granted 11 October 2022	

Reference	Applicant	Location	Description – overview	Status	Environmental Assessments
			Avenue, to the south of Bay Lane and is bound by greenfield lands to the west.		
FW22A/0300	Alexion Pharma International Operations Ltd.	College Business & Technology Park, Blanchardstown Road North, Blanchardstown, Dublin 15	Expansion of the existing Biopharmaceutical Manufacturing Campus, located at College Business and Technology Park, Blanchardstown, Dublin 15. This application relates to development which comprises an activity which holds and Industrial Emissions Directive Licence (Reg no P1030).The proposed expansion will include: (i) a new 5 storey Active Pharmaceutical Ingredient (API) manufacturing building; (ii) a new 2 storey chemical materials store; (iii) a new 4 storey laboratory building; (iv) extensions to the existing warehouse, including alterations to the previously permitted extension to the warehouse (planning ref. FW21A/0174); (v) a bunded solvent tank storage area including tanker loading and unloading yard; (vi) a chemical materials yard including liquid nitrogen storage tank, scrubbers and a thermal oxidiser abatement unit complete with c.46 m high flue stack; (vii) a manufacturing building utilities yard including chillers and other miscellaneous plant and equipment; (viii) a medium voltage electrical building and solvent area control building; (ix) an extension to the existing high level pipe rack connecting all existing and new buildings and yard areas; (x) 2 No. new diesel generators and 2 No. new bunded diesel storage tanks; (xi) modifications to site infrastructure, including; addition of 200 new car park spaces on the eastern side of the site, expansion of the site's existing storm water attenuation/fire water retention pond, and alterations and extensions to internal site roads, paving and underground services; (xii) enhancements to the site internal and boundary landscaping; (xiii) provision of a temporary contractor's compound and parking area on lands to the east of the site for the duration of the construction works.	Permission granted 04 May 2023 (final grant awaited); Lodged 15 December 2022 Registration date 15 March 2023	EIAR; AA Screening Report

Reference	Applicant	Location	Description – overview	Status	Environmental Assessments
FW22A/0319	Tech Group Europe Limited	Site fronting Damastown Road & Damastown Green, Damastown, Mulhuddart, Dublin 15	1) Construction of a 16,805 sq. m. (GFA) medical devices manufacturing facility with associated ancillary warehousing and a three storey office/administration block; 120 no. surface car parking spaces (incl. 7 no. disabled parking spaces and 12 no electric charging spaces); 40 no. cycle parking spaces (incl. 6 no. e-bike parking spaces); 12 no. motorcycle parking spaces; building and site signage and 3 no. flagpoles; 2) Construction of ancillary buildings and structures Including: 2 no. single storey security huts, an ESB Substation and MV Room, 4 no. condenser unit enclosures, a sprinkler water storage tank and pumphouse building, 10 no. materials silos and 6 no. loading docks; 3) All other associated site works required to facilitate the proposed development.	Permission granted on 25 April 2023	Natura Impact Statement (NIS); Ecological Impact Assessment Report
Proposed developments (decision pending)					
FW22A/0169	Glenveagh Homes Limited	Local Centre Lands, adjacent to the existing Tyrrelstown Local Centre, in the townland of Hollywoodrath, Dublin 15	The proposed development will consist of the construction of; a Local Centre facility of 2-4 storey height equivalent providing a primary retail unit; back of house storage (BOH), staff facilities at first floor level, lobby and circulation areas a service yard and loading bay adjoining BOH area; 3 no. ground floor retail/ retail service units; cafe unit and medical centre at first floor level. Car parking is provided at surface level to the rear of the Local Centre (157 no. car parking spaces including visitor, disabled, parent & child spaces, and EV spaces). Cycle parking is provided at surface level to the south, west, and north of the Local Centre comprising 76 no. spaces including standard spaces, staff parking, cargo spaces and electric charging stands. Road improvement works to the Hollywood Road are proposed as part of the development including the upgrade of pedestrian crossings to the north, segregated pedestrian/ cyclist facilities, a new zebra crossing, 2 no. new bus stops, 3 no. public parking spaces, and taxi set down area; associated site servicing (water	A Request for Further Information (RFI) was issued by Fingal County Council on 26th September 2022 and a further Clarification of Further Information was sought on 30 March 2023. This application is currently awaiting a decision from FCC.	EIA Screening Report and an Ecological Impact Assessment Report

Reference	Applicant	Location	Description – overview	Status	Environmental Assessments
			drainage and supply); and all associated site development works above and below ground.		
FW22A/0308	Universal Developers LLC	Cruiserath Road, Dublin 15	The proposed development consists of the following: Construction of three data centre buildings (Data Centre E, Data Centre F, and Data Centre G), each over two levels (with Data Centre F and G each including two mezzanine levels). Emergency generators and associated flues will be provided within compounds adjoining each of the three data centre buildings (1 no. for Data Centre E, 19 no. for Data Centre F, and 19 no. for Data Centre G). The development includes one diesel tank and two filling areas to serve the proposed emergency generators. Provision of ancillary structures including two MV buildings, water storage tanks and three bin stores. Construction of access arrangements and internal road network and circulation areas, footpaths, provision of car parking (105 no. spaces), motorcycle parking (12 no. spaces) and bicycle parking (56 no. spaces), hard and soft landscaping and planting (including alteration to a landscaped berm to the north of proposed Data Centre E), lighting, boundary treatments, and all associated and ancillary works including underground foul and storm water drainage network, and utility cables.	Request for additional information on 17 February 2023; Lodged 16 December 2022	EIAR
FW23A/0100	Unit 900, Northwest Logistics Park, (formally Northwest Business Park), Ballycoolin, Dublin 15	Earlstand Corporation Unlimited Company	Retention permission is sought for the following- Provision of solar panels (with an area of c.335 sq.m in total) at roof level of the warehouse/logistics unit; Amendments to the permitted northern boundary treatment, to comprise 1.8m high fencing atop a plinth wall, pending the delivery of future development to the north of site (under Reg. Ref.: FW22A/0066).	Application registered on 14 April 2023	
Proposed under Church Fields Site Strategy Plan					
There is potential for up to 500 No. additional residential units Church Fields West (to west of permitted Church Fields Housing and Eastern Linear Park Development PARTXI/012/21)					

Figure 21.1 Proposed and permitted developments in the vicinity of the proposed development at Church Fields East



22 Mitigation Measures & Monitoring

22.1 Introduction

This chapter collates the mitigation measures and monitoring set out in the preceding chapters of the EIAR. Note that this section does not include 'mitigation by design', i.e. features already integrated into the proposed development (as assessed) that mitigate environmental impacts.

The following specialist chapter has not proposed mitigation measures beyond that which is already integrated into the particulars of the proposed development:

- Chapter 16: Microclimate – Daylight & Sunlight.

22.2 General Mitigation Measures

Table 22.1 Mitigation measures - General

Ref.	Mitigation measure
Construction phase	
GE01	In order to minimise the volume of material being exported off-site, excavated material will be reused on-site (e.g. as fill material) where feasible.
GE02	Hydrocarbons, solvents and other such hazardous substances will be stored in secure, bunded hardstanding areas.
GE03	Re-fuelling and servicing of construction plant and machinery will only be permitted at suitably located, designated hardstanding areas.
GE04	Spill kits will be present on-site at all times.
GE05	The proposed construction phase working hours are as follows, subject to conditions of the planning authority: ■ Monday – Friday: 08:00 – 19:00 ■ Saturday: 08:00 – 14:00 ■ Sundays and Bank Holidays: No works Any works proposed outside of these hours, e.g. for water mains / foul drainage connections, will be subject to prior approval by Fingal County Council.
GE06	**Construction & Environmental Management Plan** A Construction & Environmental Management Plan (CEMP) has been prepared in respect of the proposed development by Brady Shipman Martin (refer to standalone document submitted under separate cover). It contains best practice measures and protocols to be implemented during the construction phase of the proposed development to avoid / minimise environmental impacts. In the preparation of this Environmental Impact Assessment Report, regard has been had to the mitigation measures and protocols proposed in the CEMP. The appointed contractor will be responsible for the implementation of the CEMP. The contractor will appoint a suitably qualified Site Environmental Manager (SEM) with responsibility for overseeing the implementation of the CEMP (and all construction phase environmental commitments). To ensure the CEMP remains fit for purpose, it will be maintained as a live document. The appointed contractor will be responsible for updating the CEMP, as required; e.g. to reflect the publication of relevant new or revised guidelines and / or new statutory requirements. The full schedule of environmental commitments (i.e. all mitigation measures set out in the CEMP and Environmental Impact Assessment Report submitted as part of the planning application, as well as any applicable conditions of development consent) will be included in the CEMP by the appointed contractor.

Ref.	Mitigation measure
GE07	**Dust Management Plan** A Dust Management Plan (**Appendix 11.1**) has been prepared by AWN Consulting for the construction phase of the proposed development, the implementation of which will provide for the proactive control of fugitive dust. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan.
GE08	**Construction Traffic Management Plan** Prior to works commencing on-site, a Construction Traffic Management Plan will be prepared by the appointed contractor in accordance with the following guidance documents: ■ Department of Transport's Traffic Signs Manual (2010), Chapter 8: Temporary Traffic Measures and Signs for Roadworks; ■ Department of Transport's Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition (2010); and ■ Any additional requirements detailed in the Design Manual for Roads and Bridges (DMRB) & Design Manual for Urban Roads & Streets (DMURS).
GE9	**Resource & Waste Management Plan** A project-specific Resource & Waste Management Plan (RWMP) has been prepared by AWN Consulting in line with the requirements of the EPA '*Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)*, and is included as part of the planning documentation. The implementation of the mitigation measures presented in the RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development. Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP in agreement with FCC, or submit an addendum to the RWMP to FCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream. The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction phase.
GE10	**Arboricultural Method Statement** A Tree Survey Report has been prepared in respect of the proposed development by Independent Tree Surveys, and submitted under separate cover as part of the planning application. It contains an Arboricultural Method Statement and general recommendations in relation to tree protection on construction sites. The method statement and recommendations contained in the Tree Survey Report shall be integrated into the final CEMP, and implemented in full during the proposed construction works.
Operational phase	
GE11	**Travel Plan** A Travel Plan has been prepared by Waterman Moylan for the operational phase of the proposed development (refer to standalone document submitted under separate cover), to promote sustainable mobility among the residents of the proposed development through a range of measures. The Operator of the site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of the Travel Plan. This is intended to be a live document, to be updated by the Applicant / Operator, where appropriate, e.g. to ensure the Plan remains fit for purpose and up-to-date with relevant policy.
GE12	**Operational Waste Management Plan** An Operational Waste Management Plan (OWMP) has been prepared by AWN Consulting, containing measures to promote operational phase waste management in accordance with the waste hierarchy,

Ref.	Mitigation measure
	i.e. high rates of reuse, recycling and recovery. The Operator / Facilities Management of the site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of the OWMP. This is intended to be a live document, to be updated by the Applicant / Operator, where appropriate, e.g. to ensure the Plan remains fit for purpose and up-to-date with relevant policy.

22.3 Specific Mitigation & Monitoring Measures

22.3.1 Population & Human Health

Table 22.2 Mitigation measures - Population and Human Health

Ref.	Mitigation measure
Construction phase	
PHH01	A Construction and Environmental Management Plan (CEMP) has been prepared in respect of the proposed development by Brady Shipman Martin (refer to document submitted under separate cover). The CEMP will remain a 'live document' and will be further updated by the Contractor (subject to planning approval) in advance of the proposed works, in agreement with Fingal County Council. The CEMP will be fully implemented throughout the proposed works. It will set out the measures to be implemented during the proposed works to mitigate potential impacts on the environment and local population, e.g. measures in relation to good housekeeping, site hoarding and security, traffic management, pollution control and safety.
PHH02	A Community Liaison Officer (CLO) will be appointed by the contractor for the duration of the construction phase. They will be responsible for keeping the local community and businesses informed of the timing and duration of potentially disruptive works, and for receiving and addressing concerns of local residents and businesses in relation to the proposed works.
PHH03	Chapter 11 (Air Quality) includes a suite of mitigation measures to minimise air quality (including dust) impacts during the construction phase. Mitigation measures are included in relation to dust suppression, good housekeeping, and proper storage and handling of materials. Dust Management Plan included in Appendix 11.1, shall be finalised by the appointed contractor in agreement with Fingal County Council, and implemented during the proposed works.
PHH04	Chapter 13 (Noise & Vibration) includes a suite of mitigation measures to minimise noise impacts during the construction phase. Mitigation measures are included in relation to selection of quiet plant, noise control at source, screening, hours of work, adherence to noise limits, community liaison, monitoring and vibration control.
PHH05	Chapter 14 (Landscape & Visual) includes a number of mitigation measures to minimise the impacts of the proposed works on landscape and visual amenity. Mitigation of landscape and visual impacts during the construction phase is focused on ensuring protection of elements to be retained and providing for a degree of visual screening of particular aspects of the works (e.g. the construction compounds).
PHH06	Chapter 17 (Traffic & Transportation) includes a suite of measures in relation to dust and dirt control measures, noise assessment and control measures, routes to be used by vehicles, working hours of the site, details of construction traffic forecasts, times when vehicle movements and deliveries will be made to the site, facilities for loading and unloading, facilities for parking cars and other vehicles. It requires the implementation of a Construction

Ref.	Mitigation measure
	Traffic Management Plan, to be prepared by the appointed contractor during pre-construction phase in agreement with Fingal County Council.
PHH07	Chapter 18 (Material Assets- Waste) includes a suite of measures in relation to management of construction waste to minimise the impacts of all site construction activities. A Resource and Waste Management Plan prepared as part of the application shall be implemented throughout the construction phase of the proposed development.
PHH08	Chapter 19 (Material Assets- Services) includes a suite of measures in relation to management of water supply, wastewater, surface water, gas, ESB supply and telecommunications during the construction phase.
Operational phase	
PHH09	Chapter 13 (Noise & Vibration) includes a suite of mitigation measures to minimise noise impacts during the operational phase. Mitigation measures are included in relation to building services noise. At the detailed design stage, best practice measures relating to building services plant will be taken to ensure there is no significant noise impact on NSLs adjacent to the development.
PHH10	Chapter 17 (Traffic & Transportation) includes a suite of measures in relation to encourage residents of the proposed development to reduce the dependence on private car and avail of sustainable forms of transport such as walking, cycling and public transport. A Travel Plan has been prepared for the subject development and accompanies the documentation package under a separate cover.
PHH11	Chapter 14 (Landscape & Visual) includes a number of mitigation measures to minimise the impacts of the proposed works on landscape and visual amenity. These include measures in relation to good quality architectural design, provision of open spaces, enhanced and additional tree planting etc.
PHH12	Chapter 18 (Material Assets- Waste) includes a suite of measures in relation to management of operational phase waste to minimise the impacts of the operational phase of the proposed development. An Operational Waste Management Plan prepared as part of the application shall be implemented throughout the operational phase of the proposed development.

Table 22.3 Monitoring - Population and Human Health

Phase	Monitoring measure
Construction	Monitoring and maintenance recommended in Chapters 11 (Air Quality), 13 (Noise & Vibration) 17 (Traffic & Transportation) and 18 (Material Assets - Waste) shall be implemented in full during the construction and / or operational phases of the proposed development, as specified in those respective chapters. Beyond that which has been recommended elsewhere in this EIAR, no additional monitoring is considered necessary in respect of population and human health.

22.3.2 Biodiversity

Table 22.4 Mitigation measures - Biodiversity

Ref.	Mitigation measure
Construction phase	
BIO01	The proposed development incorporates a comprehensive landscape design, with biodiversity-focussed planting (refer to Chapter 14 (Landscape & Visual, prepared by Brady Shipman Martin) and the Landscape Design Statement and Landscape Masterplan drawings (prepared by Brady Shipman Martin and submitted as part of this application under separate cover). The planting and long-term management proposed in the Landscape Design Statement will enhance the biodiversity resource on the proposed development site by enhancing the retained habitats and creating new, pollinator-friendly habitats.
BIO02	No designated conservation areas will be impacted in any way by the proposed development and no mitigation measures are required in this regard. Refer to the AA Screening Report that accompanies the planning application for full details in relation to European designated sites.
BIO03	The tree felling works will be carried out by a qualified and experienced tree surgeon in accordance with *BS3998 (2010) Tree Work – Recommendations*. The Tree Survey Report recommends erecting sturdy tree protection fencing or suitable site hoarding to prevent construction work encroaching the root protection areas of the beech trees outside the eastern site boundary and the hedgerow to the south (outside the red line) of the proposed development. Where machinery encroaches the RPAs of trees around the site under unforeseen and unavoidable circumstances; suitable ground protection will be put in place to prevent any significant soil compaction or root damage near the trees. This includes suitable strength ground protection mats or cellular confinement system capable of supporting the appropriate weight.
BIO04	The Tree Survey Report recommends transplanting the young oak saplings from the scrub clearance area in the northern part of the site. The Brady Shipman Martin Landscape Design Statement similarly recommends incorporating these oak saplings within the landscaped areas along the eastern site boundary. These young trees will be protected with tree protection fencing prior to works commencing. The fencing will be retained in place until such time as the trees can be transplanted.
BIO05	As set out in the Landscape Design Statement and Landscape Masterplan drawings, a significant amount of new planting has been incorporated into the landscape design, and the planting has been designed with a view to maximising the new biodiversity resource at the proposed development site. The proposed planting / landscaping strategy includes a mix of appropriate species, incorporating species that will attract feeding invertebrates, including moths, butterflies and bees. It takes account of and implements the policies and objectives of the *All-Ireland Pollinator Plan (2021 - 2025)*[24]. Low-maintenance tree groups and wildflower meadows are being provided, as are nest boxes and insect hotels and areas of bare ground (for solitary bees).
BIO06	To the south of the proposed development, 2.2 hectares of Class 1 Open Space has been provided as Eastern Linear Park (previously permitted under FCC Ref. PARTXI/012/21). Class 2 open space will be provided within the site boundary in central pocket park (2,000sqm) and eastern open space (5,600sqm). Additional open space (3,200sqm) will be provided under the overhead powerlines in the north-east corner of the site. Finally, communal open space is

[24] NBDC (2021)

Ref.	Mitigation measure
	proposed for each of the apartment blocks along with a landscape buffer area along Damastown Avenue to the north of the site.
BIO07	The proposed planting schedule contains no invasive species and none will be introduced, either deliberately or inadvertently, to the proposed development site. Appropriate biosecurity measures will be implemented during the construction phase of the proposed development under the scope of a Biosecurity Plan (refer to **Appendix 8.2** – Outline Biosecurity Plan).
BIO08	The clearance of scrub and other vegetation that may be suitable for use by nesting birds will be undertaken outside the bird nesting season (avoiding the period 1 March to 31 August). Should the construction programme require vegetation clearance between March and August, and this is unavoidable, bird nesting surveys will be undertaken by suitably qualified ecologists. If no active nests are recorded, vegetation clearance will take place within 24 hours. In the event that active nests are observed, an appropriately sized buffer zone (up to 5 m radius around the nest) will be maintained around the nest until such time as all the eggs have hatched and the birds have fledged – a period that may be three weeks from the date of the survey. Once it is confirmed that the birds have fledged and no further nests have been built or occupied, vegetation clearance may take place immediately.
BIO9	There will be no impacts on badgers or other large mammals. Regardless, a pre-construction check for badgers will be undertaken prior to the commencement of construction, to ensure this remains the case.
BIO10	As bats are highly mobile creatures, a bat specialist shall examine the trees (i.e. the poplar trees and others in the northern part of the site) for bat roost potential and for the presence of bats before felling commences. The trees shall be assessed by a bat specialist from height if due for felling in winter or by a bat detector assessment (or a combination of both) if felling occurs at any other time. The discovery of any bat roosts, albeit unlikely, shall require a derogation from the National Parks and Wildlife service. If a bat survey has been undertaken by a bat specialist and bats have been determined to be absent, felling may proceed under the supervision of a bat specialist. If there is any doubt regarding the presence of bats, access from height shall be provided to allow the examination of any trees with roost potential prior to felling.
BIO11	It is proposed to install a significant number of bat and bird boxes both throughout the proposed development site. The reason for the installation of bat boxes is not to provide replacement roosts; rather, it is to augment the overall ecological value of the site. This will contribute to maximising the ecological value of the proposed development. To that end a number of bat and bird boxes will be erected, with advice from the project Ecologist, in appropriate areas (within unlit areas away from traffic and likely disturbance within the site, no less than 3m above the ground in uncluttered areas, facing in a southerly direction). The locations of the bat boxes shall be agreed with a bat specialist. A total of four combined bat/swift bricks, or equivalent, will be installed.
BIO12	Bats are sensitive to light at night, and the lighting design will ensure that the proposed development will not result in impacts on bats that do commute / forage in or near the proposed development site.
BIO13	The lighting design for the proposed development includes the following measures:

Ref.	Mitigation measure
	■ Where human safety permits it, dark corridors and dark areas will be incorporated into the open space and landscape design for the proposed development; ■ All luminaires shall lack UV elements when manufactured and shall be LED; ■ A warm white spectrum shall be adopted to reduce blue light component; ■ Luminaires shall feature peak wavelengths higher than 550 nm; ■ Tree crown shall remain unilluminated. Specifically, no light spill will impact on the beech trees to the east of the proposed development site.
BIO14	The surface water mitigation measures proposed in Chapter 10 (Hydrology) and in the CEMP, to be finalised by the appointed contractor in agreement with Fingal County Council, will ensure that no sediment contamination, contaminated run-off or untreated wastewater will enter any on-site surface water ditches and drains and, in particular, the Pinkeen River and River Tolka (downstream of the site) as a result of the construction of the proposed development.
Operational phase	
BIO15	There will be no impacts on foul water treatment capacity at the Ringsend WwTP as a result of the proposed development. No mitigation measures are required.
BIO16	There will be no impacts related to surface water, including on downstream rivers, as a result of the proposed development. The proposed development is designed in accordance with the principles of SuDS as embodied in the recommendations of the GDSDS, which addresses the issue of sustainable water management by requiring designs to comply with a set of drainage criteria which aim to minimize the impact of urbanization, by replicating the run-off characteristics of the greenfield site. The criteria provide a consistent approach to addressing the increase in both rate and volume of run-off, as well as ensuring the environment is protected from any pollution from roads and buildings. No corresponding mitigation measures are required.

Table 22.5 Monitoring- Biodiversity

Phase	Monitoring measure
Construction	A suitably experienced Project Ecologist will be appointed for the duration of the construction phase and regular monitoring of all related works will take place to ensure the correct and full implementation of all mitigation measures. The Project Ecologist will ensure that all construction works take place in accordance with planning conditions, the project CEMP and the mitigation measures set out in this EIAR.
	Vegetation clearance will only be permitted outside the bird-nesting season. Should vegetation clearance be required during the bird nesting season, and should this work be unavoidable, such clearance will take place only after the Project Ecologist has undertaken a survey to ensure that no active bird nests or recently fledged birds are present. Pre-construction surveys will be required to ensure that any necessary tree felling or works to buildings continue to have no impact on roosting bats, other than as permitted in relation to the removal of the Leisler's bat mating roost.
Operational	The bat and bird boxes installed on the site will be checked annually for a period of two years post-completion of the works, to ensure that they continue to be accessible to these species. If necessary they will be repositioned within the site.

Phase	Monitoring measure
	On completion of construction, the lighting installed will be reviewed by the Project Ecologist and a bat specialist, to ensure that it is operating according to the approved specifications.

22.3.3 Land, Soils, Geology & Hydrogeology

Table 22.6 Mitigation measures - Land, Soils, Geology & Hydrogeology

Ref.	Mitigation measure
Construction phase	
LSG01	A quantity of topsoil and subsoil will need to be excavated to facilitate the proposed development. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.
LSG02	During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts.
LSG03	Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds).
LSG04	Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
LSG05	A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate.
LSG06	A stabilised entranceway consisting of an aggregate on a filter cloth base that is located at any entry or exit point of the construction site.
LSG07	Aggregate will be established at the site entrance points from the construction site boundary extending for at least 10 m.
LSG08	The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection.
LSG09	Construction materials, including aggregates etc. will be stored a minimum of 20-meter buffer distance from any surface water bodies and surface water drainage points.
LSG10	Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.
LSG11	Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.
LSG12	Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.
LSG013	Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.
LSG14	All fill and aggregate for the proposed development will be sourced from reputable suppliers per the project Contract and Procurement Procedures. All suppliers will be vetted for:

Ref.	Mitigation measure
	■ Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development; ■ Environmental Management status; and ■ Regulatory and Legal Compliance status of the Company.
LSG15	Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.
LSG16	No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Uisce Éireann / FCC.
LSG17	The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.
LSG18	The following mitigation measures will be implemented during the construction phase to prevent any spillages to ground of fuels and other construction chemicals and prevent any spillages resulting to surface water and groundwater systems: ■ Designation of bunded refuelling areas on the Site; ■ Provision of spill kit facilities across the Site; ■ Where mobile fuel bowsers are used, the following measures will be taken: □ Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use; □ The pump or valve will be fitted with a lock and will be secured when not in use; □ All bowsers to carry a spill kit and operatives must have spill response training; □ Portable generators or similar fuel containing equipment will be placed on suitable drip trays.
LSG19	In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted: ■ Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area; ■ Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal. ■ Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage; ■ All drums to be quality approved and manufactured to a recognised standard; ■ If drums are to be moved around the Site, they will be secured and on spill pallets; and ■ Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.
LSG20	Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible

Ref.	Mitigation measure
	off the site). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "*Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors*" (CIRIA 532, 2001) will be complied with.
LSG21	The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.
Operational phase	
LSG22	The proposed development design includes hardstand cover across the site and as set out in the EAR (2023) the proposed/existing surface water drainage system for this development has been designed as a sustainable urban drainage system and uses overground detention basins together with a flow control device, green roofs, swales, detention basins, rainwater harvesting and petrol interceptors. Therefore, the risk of accidental discharge has been adequately addressed through design.

Table 22.7 Monitoring- Land, Soils, Geology & Hydrogeology

Phase	Monitoring measure
Construction	The management of land, soils and ground water during the construction phase will be monitored by the Contractor to ensure compliance with above-listed mitigation measures, and relevant waste management legislation and local authority requirements.
	During construction phase the following monitoring measures will be implemented: ■ Regular inspection of surface water run-off and sediments controls (e.g., silt traps); ■ Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off; and ■ Regular inspection of construction / mitigation measures (e.g., concrete pouring, refuelling, etc).

22.3.4 Hydrology

Table 22.8 Mitigation measures - Hydrology

Ref.	Mitigation measure
Construction phase	
HYD01	Construction works and the proposed mitigation measures are informed by best practice guidance from Inland Fisheries Ireland on the prevention of pollution during development projects including but not limited to: ■ Construction Industry Research and Information Association (CIRIA), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532); ■ Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016); ■ Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (4th edition), (C741); and ■ Enterprise Ireland Best Practice Guide, Oil Storage Guidelines (BPGCS005).

Ref.	Mitigation measure
HYD02	The CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the CEMP will be employed on site during the construction phase. All mitigation measures outlined here, and within the CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed. The CEMP will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.
HYD03	During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts.
HYD04	Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal.
HYD05	Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds).
HYD06	Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
HYD07	A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate.
HYD08	The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection.
HYD09	Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.
HYD10	Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.
HYD11	Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.
HYD12	Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.
HYD13	Any surface water run-off collecting in excavations will likely contain a high sediment load. This will not be allowed to directly discharge directly to the stormwater sewer, Pinkeen River.
HYD14	All manholes will be watertight to prevent groundwater ingress into the foul drainage system. Construction details for the proposed drainage systems are included in the accompanying planning submission drawings.
HYD15	The outfall pipe from the development is a Ø300mm pipe laid at a minimum gradient of 1:200 which has sufficient capacity to serve all of the future development on the Church Fields lands, and outfall into the existing 900mm diameter infrastructure located approximately 800m to the west of the site. Therefore, there is adequate capacity in the public foul sewer available to cater for the proposed development. The proposed foul network has been designed with

Ref.	Mitigation measure
	Causeway Flow software and will discharge via gravity. Please see Appendix B for details of the foul water design calculations
HYD16	All excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.
HYD17	Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be established prior to the commencement of the initial infrastructure construction works to collect and discharge any treated construction water during construction.
HYD18	Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.
HYD19	No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Uisce Éireann / FCC.
HYD20	The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.
HYD21	The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to surface water and groundwater systems: ■ Designation of bunded refuelling areas on the Site; ■ Provision of spill kit facilities across the Site; ■ Where mobile fuel bowsers are used, the following measures will be taken: □ Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use; □ The pump or valve will be fitted with a lock and will be secured when not in use; □ All bowsers to carry a spill kit and operatives must have spill response training; □ Portable generators or similar fuel containing equipment will be placed on suitable drip trays.
HYD22	In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted: ■ Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area; ■ Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a

Ref.	Mitigation measure
	volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal. ■ Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage; ■ All drums to be quality approved and manufactured to a recognised standard; ■ If drums are to be moved around the Site, they will be secured and on spill pallets; and Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.
HYD23	Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.
HYD24	The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.
HYD25	Rainfall at the construction site will be managed and controlled for the duration of the construction works until the permanently intercepted and attenuated surface water drainage system of the proposed site is complete. In the meantime, rainwater will continue to discharge to ground as current.
HYD26	Spill containment measures will be in place to manage any accidental releases to ground. Silt Remediation Treatment System including a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds) to manage silty run-off.
HYD27	Foul wastewater discharge from the site will be managed and controlled for the duration of the construction works. Prior to connection to sewer, site welfare facilities will be established to provide sanitary facilities for construction workers on site. The main contractor will ensure that sufficient facilities are available at all times to accommodate the number of employees on site and are disposed of by a licenced contractor.
HYD28	During construction a site drainage and protection system will be built to reduce the flow of run-off from the site, prevent soil erosion, and protect water quality in the Pinkeen River. Temporary excavated channels, bunds, or ridges or a combination of the three, may be constructed to divert sediment-laden water to an appropriate sediment retention structure. These will be installed to provide permanent diversion of clean stormwater away from erosion exposed soil areas, or to provide a barrier between exposed areas and unexposed areas of the construction site. Runoff diversion channels/bunds need regular maintenance to keep functioning throughout their life.
HYD29	Silt fences will be installed on the site where construction is proposed to detain flows from runoff so that deposition of transported sediment can occur through settlement. Inspection and maintenance of the silt fences during construction phase is crucial to ensuring that they work as intended. They will remain in place throughout the entire construction phase.
HYD30	It is envisaged that a number of geotextile lined settling tank / basins (e.g. Silt buster) and/or silt fences will be installed to ensure silts do not flow off site during the construction stage.

Ref.	Mitigation measure
	This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed. All inlets to the settling basins will be 'riprapped' to prevent scour and erosion in the vicinity of the inlet.
HYD31	Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be established prior to the commencement of the initial infrastructure construction works to collect and discharge any treated construction water during construction.
Operational phase	
HYD32	The design has taken account of the potential impacts of the development on surface water quality; measures have been incorporated in the design to mitigate these potential impacts. The proposed development stormwater drainage network design includes sustainable drainage systems (SuDS). These measures by design ensure the stormwater leaving the site is to be attenuated and treated within the new development site boundary to ensure suitable quality, before discharging to the existing public surface water network, which subsequently outfalls to the nearby Pinkeen River.
HYD33	The purpose of the proposed design is to: ■ Treat runoff and remove pollutants to improve quality; ■ Restrict outflow and to control quantity; ■ Increase amenity value.
HYD34	It is proposed to strictly separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the local public surface water and wastewater sewer networks respectively. Run off from car park areas will discharge through interceptors.
HYD 35	The design has taken account of the potential impacts of the development on surface water flow; measures have been incorporated in the design to mitigate these potential impacts. There are no direct discharges to any open water courses included in the design. As set out in the Waterman Moylan Consulting Engineers Ltd Engineering Assessment Report (2023) flow restriction is achieved by means of a hydro-brake, or similar approved, installed at the outfall manhole of each surface water catchment within the development, with the excess storm water stored on site for the duration of the storm periods of up to 1 in 100 years. The surface water network has been designed to provide sufficient capacity to contain and convey all surface water run-off associated with the 1-in-100-year event to the attenuation basins without any overland flooding.
HYD36	The proposed development includes a new surface water network which will mitigate the pluvial risk to the site in line with SuDS measures.
HYD37	Water conservation measures will be used, to reduce overall potable water demand and consumption, including low volume flush / dual flush WC's, spray taps, draw off tap controls, leak detection measures – through the metering of supply.

Table 22.9 Monitoring- Hydrology

Phase	Monitoring measure
Construction	During construction phase the following monitoring measures will be considered: ■ Contractors will carry out regular inspections to confirm compliance with the CEMP. Daily inspections by contractors will address potential environmental impacts including dust, litter, waste management and general housekeeping. ■ Regular inspection of surface water run-off and sediments controls (e.g., silt traps). Inspection and maintenance of the silt fences during construction phase is crucial to ensuring that they work as intended. They will remain in place throughout the entire. ■ Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off. ■ Regular inspection of construction / mitigation measures (e.g., concrete pouring, refuelling, etc). ■ Silt remediation treatment system.
Operational	No future surface water monitoring is proposed for the proposed development due to the low hazard potential at the site. Oil separators / petrol interceptors will be maintained and cleaned out in accordance with the manufacturer's instructions. Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to surface water.

22.3.5 Air Quality

Table 22.10 Mitigation measures – Air Quality & Climate

Ref.	Mitigation measure
Construction phase	
AQC01	The proactive control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released.
AQC02	Dust Management Plan (**Appendix 11.1**) shall be implemented for the duration of the Construction Phase. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan.
AQC03	The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised.
AQC04	During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust.
AQC05	Drop heights from conveyors, loading shovels, hoppers and other loading equipment will be minimised, if necessary fine water sprays should be employed.
AQC06	In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.
Operational phase	

Ref.	Mitigation measure
There is no mitigation required for the operational phase of the development as impacts to air quality are predicted to be neutral and imperceptible.	

Table 22.11 Monitoring- Air Quality & Climate

Phase	Monitoring measure
Construction	Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m^2/day during the monitoring period of 30 days (+/- 2 days).

22.3.6 Climate

Table 22.12 Mitigation measures - Climate

Ref.	Mitigation measure
Construction phase	
C01	Creating a construction program which allows for sufficient time to determine reuse and recycling opportunities for wastes.
C02	Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled.
C03	Materials will be reused on site within the new build areas where possible.
C04	Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
C05	Ensure all plant and machinery are well maintained and inspected regularly.
C06	Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
C07	Sourcing materials locally where possible to reduce transport related CO_2 emissions.
Operational phase	
C08	A number of measures have been incorporated into the design of the development to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change.
C09	The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. The Energy Statement prepared by Waterman Moylan and submitted under separate cover with this planning application details a number of incorporated design mitigation measures that have been incorporated into the design of the

Ref.	Mitigation measure
	development to reduce the impact on climate wherever possible. Such measures included in the proposed development to reduce the impact to climate from energy usage are: ■ Achieve air tightness standards of 3 $m^3/m^2/hr$; ■ Ensure thermal bridging details are designed to achieve thermal bridging factors of 0.08W/m2K (houses) / 0.15W/m^2K (Apartments) or less; ■ Meet or exceed minimum U-Value standards identified in Part L 2022 Dwellings; ■ Provide an appropriate combination of technologies to ensure energy consumption is in line with Part L 2022 Dwellings requirements; and ■ All in-curtilage parking spaces will be capable of being fitted with EV charging points. All off-curtilage spaces will be ducted for EV charging, with 20% fitted out from the outset.

22.3.7 Noise & Vibration

Table 22.13 Mitigation measures – Noise & Vibration

Ref.	Mitigation measure
Construction phase	
NV01	The appointed contractor will be required to take specific noise abatement measures to the extent required and comply with the recommendations of BS 5228–1 (BSI 2014a) and S.I. No. 241/2006 - European Communities (Noise Emissions by Equipment for Use Outdoors) (Amendment) Regulations 2006. These measures will ensure that: ■ During the Construction Phase, the appointed contractor will be required to manage the works to comply with the limits detailed in Section 13.2.3 using methods outlined in BS 5228–1 (BSI 2014a); and ■ The best means practicable, including proper maintenance of plant and equipment, will be employed to minimise the noise produced by on-site operations.
NV02	BS 5228–1 includes guidance on several aspects of construction site practices, which include, but are not limited to: ■ Selection of quiet plant; ■ Control of noise sources; ■ Screening; ■ Hours of work; ■ Liaison with the public; and ■ Monitoring. The contractor will put in place the most appropriate noise control measures depending on the level of noise reduction required during specific phases of work.
NV03	The potential for any item of plant to result in exceedance of construction noise thresholds will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever practicable (e.g. plant items with sound attenuation incorporated). Should a particular item of plant already on the site be found to exceed the construction noise thresholds, the first action will be to identify whether the item can be replaced with a quieter alternative.
NV04	The appointed contractor will evaluate the choice of excavation, breaking or other working method taking into account various ground conditions and site constraints. Where alternative

Ref.	Mitigation measure
	lower noise generating equipment are available that will provide equivalent results, these will be selected to control noise within the relevant thresholds, where it is practicable to do so.
NV05	For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilising an acoustic canopy to replace the normal engine cover and / or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB.
NV06	For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed.
NV07	Where compressors, generators and pumps are located in proximity to NSLs and have the potential to exceed the construction noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
NV08	Resonance effects in panel work or cover plates can be reduced through stiffening or the application of damping compounds, while other noise nuisance can be controlled by fixing resilient materials in between the surfaces in contact.
NV09	Screening is an effective method of reducing CNLs at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver. BS 5228–1 (BSI 2014a) states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material.
NV10	Erection of localised demountable enclosures or screens will be used around piling rigs, breakers or drill bits, as required, when in operation in proximity to NSLs with the potential to exceed the construction noise thresholds. Annex B of BS 5228–1 (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on-site from standard materials. A well placed and designed mobile temporary screen around a piece of equipment or construction activity can effectively reduce noise emissions by 10 dB(A).
NV11	In addition, careful planning of the construction site layout will also be considered. The placement of site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening.
NV12	Working hours will be restricted to 08:00 to 19:00 Monday to Friday & 08:00 to 14:00 on Saturdays. No Sunday or Bank Holiday work will be permitted. Out of hours working will be only permitted by arrangement with site management. Work outside of normal hours will be subject to approval by Fingal County Council
NV13	The contractor will establish clear forms of communication that will involve the appointed contractor to NSLs in proximity to the works, so that residents or building occupants are aware of the likely duration of activities likely to generate noise or vibration that are potentially significant.
NV14	A clear communication programme will be established by contractor to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration

Ref.	Mitigation measure
	levels likely to result in significant effects. The nature and duration of the works will be clearly set out in all communication circulars as necessary
NV15	Appropriate vibration isolation shall be applied to plant (such as resilient mounts to pumps and generators), where required and where feasible.
Operational phase	
NV16	The selection and design of operational plant items with potential to emit noise to atmosphere will be designed to comply with the noise control guidance from BS 4142 (BSI 2014).
NV17	The use of perimeter plant screens will be used, where required, to screen noise sources.
NV18	The use of acoustic enclosures will be used, where required, for plant areas deemed to be excessively noisy during the detailed design phase to attenuate noise sources.
NV19	The use of attenuators or silencers will be installed on external air-handling plant.
NV20	All mechanical plant items, e.g. fans, pumps etc., shall be regularly maintained to ensure that excessive noise generated by worn or rattling components is minimised.
NV21	Any new or replacement mechanical plant items, including plant located inside new or existing buildings, shall be designed so that all noise emissions from site do not exceed the noise limits outlined in this document.
NV22	Installed plant will have no tonal or impulsive characteristics when in operation.

Table 22.14 Monitoring – Noise & Vibration

Phase	Monitoring measure
Construction	During the construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017).
Operational	There are no proposed monitoring requirements associated with the operational phase of the proposed Development.

22.3.8 Landscape & Visual

Table 22.15 Mitigation measures – Landscape & Visual

Ref.	Mitigation measure
Construction phase	
LV01	Construction works will be guided by a Construction Environmental Management Plan (CEMP), which shall provide the environmental management framework to be adhered to and monitored during the pre-commencement and construction phases of the Proposed Development. The CEMP will incorporate all of the mitigating principles required to ensure that the work is carried out in a way that minimises the potential for environmental impacts to occur.

Ref.	Mitigation measure
LV02	Construction compounds will not be located within the root protection area of trees or hedgerows to be retained and will be enclosed by solid hoarding. The compound areas will be fully decommissioned and reinstated at the end of the construction phase.
LV03	Trees, hedgerows and vegetation to be retained within and adjoining the works area will be protected in accordance with 'BS 5837:2012 *Trees in relation to in relation to design, demolition and construction. Recommendations*'. Works required within the root protection area (RPA) of trees, hedgerows to be retained will follow a project specific arboricultural methodology for such works, prepared / approved by a professional qualified arborist.
LV04	Trees and vegetation identified for removal will be removed in accordance with 'BS 3998:2010 *Tree Work – Recommendations*' and best arboricultural practices as detailed and monitored by a professional qualified arborist.
LV05	The construction site will be fully enclosed and secured. Construction traffic accessing the site will follow agreed routes and public roads will be maintained in a clean and safe manner.
LV06	Mitigation of landscape and visual impacts during the construction phase is focused on ensuring protection of elements to be retained and providing for a degree of visual screening of particular aspects of the works (e.g. the construction compounds).
Operational phase	
LV07	Provision of a high-quality of architectural design, character and finish for the proposed buildings and development.
LV08	Provision of significant areas of new and connected open space and pocket parks with play facilities and kick-about areas as amenity and recreation for the new communities. The proposed layout and open spaces provide for retention and incorporation of the mature beech trees along Church Road and for interface with the permitted footpath and cycleway network to the east and Eastern Linear Park to the south.
LV09	Planting of new trees along streetscapes and within open spaces. Species selected will be appropriate to the street environment and to the characteristics of this coastal edge location.
LV10	Provision of communal semi-private open space for each of the apartment blocks.
LV11	Provision of a high-quality of design and finish for landscape areas within the Proposed Scheme.
LV12	Landscape areas will be maintained for twelve months during which any defective or dead material will be replaced.
LV13	Open spaces will be managed by Fingal County Council.

Table 22.16 Monitoring – Landscape & Visual

Phase	Monitoring measure
Construction	Landscape and visual mitigation measures will be monitored during the construction stage. This will include siting of the construction compound; protection of the permitted Eastern Linear Park grounds, protection of trees / hedgerows to be retained; stripping and storage of topsoil; reinstatement of landscape / soil areas; and completion of landscape works.
Operational	No monitoring other than normal management of landscape areas is required during the operational stage.

22.3.9 Cultural Heritage, Archaeology & Architectural Heritage

Table 22.17 Mitigation measures – Cultural Heritage, Archaeology & Architectural Heritage

Ref.	Mitigation measure
Construction phase	
CAA01	Given its proximity to the church and graveyard, there is potential for associated features to be present in this area. Archaeological testing will take place to establish the degree of disturbance in this part of the site and to assess the survival of any archaeology within the site.
CAA02	Fingal County Council will make provision to allow for and fund the archaeological work that may be required at the site and the post excavation requirements in accordance with the National Monuments Legislation (1930–2004). Should any archaeological items if be discovered during construction works, they will be reported to the National Museum of Ireland (Irish Antiquities Division) and the National Monuments Service of the DHLGH who will determine the nature and extent of any archaeological work to be carried out on site.
Operational phase	
The operational phase of the development will have no impact on the cultural heritage environment of the area. No mitigation is required as part of the operation of the proposed development.	

Table 22.18 Monitoring – Cultural Heritage, Archaeology & Architectural Heritage

Phase	Monitoring measure
Construction	Given the difficulties of examining the below-ground archaeological potential of the lands in the northern and south-western portions of the site due to the extensive disturbance, it is considered that archaeological monitoring is an appropriate mitigation measure here. Archaeological monitoring of ground disturbance works will be carried out under licence to the National Monuments Service of the Department of Housing, Local Government and Heritage (DHLGH). This will ensure the full recognition of, and – if required – the proper excavating and recording of all archaeological features, finds or deposits which may lie undisturbed beneath the ground surface.

22.3.10 Traffic & Transportation

Table 22.19 Mitigation measures – Traffic & Transportation

Ref.	Mitigation measure
Construction phase	
TT01	All construction activities on-site will be governed by the traffic management measures outlined in the Construction & Environmental Management Plan (CEMP) which seeks to ensure that the impacts of all building activities during the construction of the proposed development upon both the public (off-site) and internal (on-site) workers' environments, are fully considered and proactively managed / programmed. It aims to respect all key stakeholders, thereby ensuring that both the public's and construction workers' safety is maintained at all times, and that disruptions are minimised.
TT02	The CEMP, which accompanies the documentation package under a separate cover, considers the following aspects: ■ Dust and dirt control measures;

Ref.	Mitigation measure
	■ Noise assessment and control measures; ■ Routes to be used by vehicles; ■ Working hours of the site; ■ Details of construction traffic forecasts; ■ Times when vehicle movements and deliveries will be made to the site; ■ Facilities for loading and unloading; ■ Facilities for parking cars and other vehicles.
TT03	The specific measures will include, but will not be limited to the following: ■ Issue of instructions and maps on getting to site to each supplied sub-contractor to avoid 'lost' construction traffic travelling on unapproved routes; ■ Ongoing assessment of the most appropriate routes for construction traffic to and from the site; ■ Interface with the operation of local traffic; ■ Use of a banksman and/or traffic lights to control the exit of construction vehicles; ■ Not allowing construction traffic to wait on public roads; ■ Schedule the delivery of materials daily; ■ Provision of vehicle and wheel washing facilities on site.
TT04	A detailed Construction Management Plan (CMP) and a Construction Traffic Management Plan (CTMP) will also be prepared by the main contractor prior to the construction stage. These documents, which will be prepared in coordination and agreement with the Local Authority, will outline site logistics and indicate the following: ■ Site access location; ■ Site boundary lines; ■ Tower crane locations; ■ Vehicle entry and exit routes to/from the site; ■ Diversion of pedestrian and cycling routes; ■ Location of loading and unloading areas; ■ Location of site offices and welfare facilities; ■ Location of material storage areas; ■ Banksmen locations.
Operational phase	
TT05	In order to encourage residents of the proposed development to reduce the dependence on private car and avail of sustainable forms of transport such as walking, cycling and public transport, a Travel Plan has been prepared for the subject development and accompanies the documentation package under a separate cover. The Travel Plan sets out a number of specific actions to be implemented with the objective of promoting sustainability, enhancing public transport and reducing the use of private car, such as: ■ Advising residents about approved/upgraded pedestrian and cycling network facilities such as dedicated pedestrian crossings, wide footpaths, off-road cycle lanes and greenways and dedicated cycle lanes linking to the various services and amenities in the expanded area; ■ Regularly informing residents about the bike to work scheme which may be available from their employers;

Ref.	Mitigation measure
	■ Providing information to residents about tax incentives for public transport users; ■ Publicising student LEAP travel cards and associated benefits; ■ Advising residents regarding local bus routes and the nearest bus stops, and the travel time to/from Dublin City Centre, Blanchardstown and other key destinations; ■ Providing secure cycle parking within the proposed development; ■ Providing information regarding car sharing benefits.

Table 22.20 Monitoring – Traffic & Transportation

Phase	Monitoring measure
Construction	During the construction phase the following monitoring is advised: ■ Construction vehicle routes and parking; ■ Internal and external road conditions; ■ Construction activities hours of work. The specific compliance exercises to be undertaken in relation to the range of measures detailed in the final Construction Management Plan (CMP) and Construction Traffic Management Plan (CTMP) will be agreed with the Planning Authority.
Operational	During the operational phase, the following monitoring is advised in order to further reduce the traffic effects predicted from the proposed development: ■ Car parking capacity and associated occupancy. ■ Cycle parking capacity and associated occupancy. ■ Public transport serving the area, including location of closest bus stops, service frequency and routes, and commuting times from key destinations. The Travel Plan for the proposed development should be monitored and updated at regular intervals. This will enable tracking in terms of reduction in the dependence on private car journeys and a shift towards sustainable transport options such as walking, cycling and the use of public transport.

22.3.11 Material Assets – Waste

Table 22.21 Mitigation measures - Material Assets – Waste

Ref.	Mitigation measure
Construction phase	
WA01	A project specific RWMP has been prepared in line with the requirements of the requirements of the EPA 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and is included as **Appendix 18.1**. The mitigation measures outlined in the RWMP will be implemented in full and form part of the mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.
WA02	Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (**Appendix 18.1**) in agreement with FCC, or submit an addendum to the RWMP to FCC,

Ref.	Mitigation measure
	detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
WA03	The Contractor will be required to fully implement the RWMP throughout the duration of the proposed construction phase.
WA04	A quantity of topsoil and sub soil will need to be excavated to facilitate the proposed development. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.
WA05	Building materials will be chosen with an aim to 'design out waste'.
WA06	On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated: ■ Concrete rubble (including ceramics, tiles and bricks); ■ Plasterboard; ■ Metals; ■ Glass; and ■ Timber.
WA07	Leftover materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible (alternatively, the waste will be sorted for recycling, recovery or disposal).
WA08	All waste materials will be stored in skips or other suitable receptacles in designated areas of the site.
WA09	Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required).
WA10	A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works.
WA11	All construction staff will be provided with training regarding the waste management procedures.
WA12	All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal.
WA13	All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities.
WA14	All waste leaving the site will be recorded and copies of relevant documentation maintained.
WA15	Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Regulation 27 (By-products), as amended, of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2011-2020. EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Regulation 27 will be used.
WA16	These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste

Ref.	Mitigation measure
	Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, and the EMR Waste Management Plan 2015 – 2021. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.
Operational phase	
WA17	A project specific OWMP has been prepared and is included as **Appendix 18.2**. The mitigation measures outlined in the OWMP will be implemented in full and form part of the mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the *EMR Waste Management Plan 2015 – 2021*, *A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy* and the FCC waste bye-laws.
WA18	The Operator / Facilities Management of the site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – the ongoing implementation of this OWMP, ensuring a high level of recycling, reuse and recovery at the site of the proposed development.
WA19	The Operator / Facilities Management will ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to): ■ Organic waste; ■ Dry Mixed Recyclables; ■ Mixed Non-Recyclable Waste; ■ Glass; ■ Waste electrical and electronic equipment (WEEE); ■ Batteries (non-hazardous and hazardous); ■ Cooking oil; ■ Light bulbs; ■ Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); ■ Furniture (and from time to time other bulky waste); and ■ Abandoned bicycles.
WA20	The Operator / Facilities Management will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
WA21	The Operator / Facilities Management will ensure that all waste collected from the site of the proposed development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available.
WA22	The Operator / Facilities Management will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.
WA23	These mitigation measures will ensure the waste arising from the proposed development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the

Ref.	Mitigation measure
	EMR Waste Management Plan (2015 - 2021) and the FCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

Table 22.22 Monitoring - Material Assets – Waste

Phase	Monitoring measure
Construction	The management of waste during the construction phase will be monitored by the Contactor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation. The management of waste during the operational phase will be monitored by the Operator / Facilities Management to ensure effective implementation of the OWMP internally and by the nominated waste contractor(s).

22.3.12 Material Assets – Services

Table 22.23 Mitigation measures - Material Assets – Services

Ref.	Mitigation measure
Construction phase	
SE01	Water Supply ■ All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position is accurately identified before excavation works commence. ■ All water mains will be cleaned, sterilised, and tested to the satisfaction of the Uisce Éireann /Local Authority prior to connection to the public water main. ■ All connections to the public water main will be carried out under the supervision of the Uisce Éireann /Local Authority.
SE02	Wastewater ■ All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position accurately identified before excavation works commence. ■ Foul water pipes to be laid with sufficient falls to ensure self-cleansing velocity. ■ Foul pipes will be carefully laid so as to minimise the potential for cross connections.
SE03	Surface Water ■ The contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment. ■ Regular testing of surface water discharges will be undertaken at the outfall from the subject site. ■ Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The cleaned system will start working again. ■ Careful removal of contaminated material from site during the works in accordance with an approved plan. ■ All fuels and chemicals will be bunded, and where applicable, stored within double skinned tanks / containers with the capacity to hold 110% of the volume of chemicals and fuels contents. Bunds will be located on flat ground a minimum distance of 50 m from any watercourse or other water conducting features, including the cut off trenches. ■ All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position is accurately identified before excavation works commence.

Ref.	Mitigation measure
	■ Temporary traffic management will be implemented as appropriate during the construction of the connections at tie-in to existing surface water networks. ■ Surface Water pipes will be carefully laid so as to minimise the potential for cross connections.
SE04	Gas ■ All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position accurately identified before excavation works commence. ■ The contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment. ■ Any works required on existing gas mains will be completed directly by the Gas Networks Ireland or by the specialist sub-contractors appointed on their behalf and any loss of supply will be managed by Gas Networks Ireland.
SE05	ESB Supply ■ All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position accurately identified before excavation works commence. ■ The contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment. ■ All connections to the existing ESB Network will be completed directly by ESB Networks and any loss of supply will be managed by ESB Networks to minimise impact on neighbouring properties.
SE06	Telecommunications All connections to the existing telecoms infrastructure will be completed directly by the telecoms providers or by the specialist sub-contractors appointed on their behalf and any loss of supply will be managed by the respective telecoms providers to minimise impact on neighbouring properties.
Operational phase	
SE07	Water Supply ■ It is not envisaged that any other remedial or reductive measures will be necessary upon the completion of the development.
SE08	Wastewater ■ The foul network will be inspected and maintained as required.
SE09	Surface Water ■ Flow restrictors with attenuation storage will be used to slowdown and store surface water runoff from discharging above green field rates to the receiving network. ■ Attenuation systems will be constructed on-line to intercept the first flush during rainfall events after periods of dry weather. ■ Sustainable urban drainage measures such as permeable paving, green roofs, infiltration trenches, and rain gardens will be provided. ■ A petrol interceptor will be installed to prevent hydrocarbons entering the local drainage system. ■ The attenuation storage systems will be constructed at a fall to maintain movement of water and thus prevent stagnation. Silt would be collected at a sump and removed periodically.

Ref.	Mitigation measure
	■ Regular maintenance of the drainage network including petrol interceptor shall be undertaken. ■ The drainage network will be inspected annually and maintained.
SE10	Gas ■ All works will be completed in accordance with Gas Networks Ireland's details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.
SE11	ESB Supply ■ All works will be completed in accordance with ESB details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.
SE12	Telecommunications ■ All works will be completed in accordance with the relevant utility providers' details and standards and will be deemed to be safe for use with no impact the receiving environment once installed.

Table 22.24 Monitoring- Material Assets – Services

Phase	Monitoring measure
Construction	Monitoring will be provided by each utility company with an overseeing responsibility by the appointed contractor during the construction phase. The construction and waste management plans will be adhered to.
Operation	■ The water usage within the proposed development will be monitored via the bulk water meters. Records will be maintained by Uisce Éireann to ensure any excess usage is identified and investigated as necessary. ■ Uisce Éireann will monitor the operation of the foul drainage network including the receiving environment. ■ The provision of utility services including electricity and broadband will be monitored by the relevant utility providers.

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